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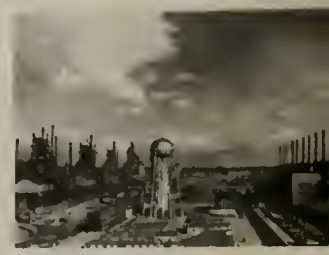


ON THE COVER:
Kaiser Steel plant in Fontan
California. Here, process water ar
cooling water are extensively rec
culated and reused. (See page 76

Department of
Water Resources

Bulletin No. 124-2

Water Use by Manufacturing Industries In California 1970

March 1977

Claire T. Dedrick
Secretary for Resources

The Resources
Agency

Edmund G. Brown Jr.
Governor

State of
California

Ronald B. Robie
Director

Department of
Water Resources

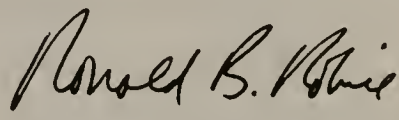
FOREWORD

Bulletin No. 124-2 presents the results of a statewide survey of water use in 1970 by California manufacturing industries. A prior survey in 1960, covering the period of 1957 through 1959, was reported in Bulletin No. 124 (April 1964).

Knowledge of the water intake requirements of manufacturing industries is highly important to local and regional management planning. The data obtained from the current survey will provide basic information for water resources management actions throughout the State. The survey was conducted with the cooperation and financial participation of the U. S. Army Corps of Engineers and the U. S. Bureau of Reclamation. This participation enabled a far more complete survey than otherwise would have been possible.

Manufacturing industries in California use almost 1 170 cubic hectometres (950,000 acre-feet) of fresh water annually. This represents 19 percent of the total urban use. Manufacturing is expanding; the number of industrial plants in 1970 was about 30,000, up some 3,000 since 1958. In addition, the relative percentages of the various types of industries and their rates of water use have changed significantly.

Despite the increasing number of manufacturing plants in California, total industrial water use has remained at about the same level as in the 1960 survey. A major factor is the stringent environmental requirements for improved water quality. Current waste discharge controls have caused many industries to treat and reuse waste water and thus reduce fresh water intake.



Ronald B. Robie, Director
Department of Water Resources
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State of California

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ACKNOWLEDGMENT

The Department and the other agencies involved in this survey express sincere appreciation for the effort and assistance extended by California manufacturers in providing data contained in this report.

Special acknowledgment is also extended to the California Manufacturers Association for encouraging the cooperation of their membership.

* * * * * * * * *

The survey of 1970 industrial water use reported in this bulletin is the second such study made by the Department of Water Resources. The Department conducted its first survey in 1960, and published the results in Bulletin No. 124, Water Use by Manufacturing Industries in California, 1957-1959 (April 1964).

CONVERSION FACTORS

English to Metric System of Measurement

Quantity	English unit	Multiply by	To get metric equivalent
Length	inches (in)	25.4	millimetres (mm)
		.0254	metres (m)
	feet (ft)	.3048	metres (m)
	miles (mi)	1.6093	kilometres (km)
Area	square inches (in^2)	6.4516×10^{-4}	square metres (m^2)
	square feet (ft^2)	.092903	square metres (m^2)
	acres	4046.9	square metres (m^2)
		.40469	hectares (ha)
		.40469	square hectometres (hm^2)
		.0040469	square kilometres (km^2)
	square miles (mi^2)	2.590	square kilometres (km^2)
Volume	gallons (gal)	3.7854	litres (l)
		.0037854	cubic metres (m^3)
	million gallons (10^6 gal)	3785.4	cubic metres (m^3)
	cubic feet (ft^3)	.028317	cubic metres (m^3)
	cubic yards (yd^3)	.76455	cubic metres (m^3)
	acre-feet (ac-ft)	1233.5	cubic metres (m^3)
		.0012335	cubic hectometres (hm^3)
		1.233×10^{-6}	cubic kilometres (km^3)
Volume/Time (Flow)	cubic feet per second (ft^3/s)	28.317	litres per second (l/s)
		.028317	cubic metres per second (m^3/s)
	gallons per minute (gal/min)	.06309	litres per second (l/s)
		6.309×10^{-5}	cubic metres per second (m^3/s)
	million gallons per day (mgd)	.043813	cubic metres per second (m^3/s)
Mass	pounds (lb)	.45359	kilograms (kg)
	tons (short, 2,000 lb)	.90718	tonne (t)
		907.18	kilograms (kg)
Power	horsepower (hp)	0.7460	kilowatts (kW)
Pressure	pounds per square inch (psi)	6894.8	pascal (Pa)
Temperature	Degrees Fahrenheit (°F)	$\frac{tF - 32}{1.8} = tC$	Degrees Celsius (°C)

Boiler plant in a northern California paper mill.

Chapter I. INTRODUCTION

Industry is an important element in water planning for the future because about 20 percent of all water required to meet urban uses[1] is for manufacturing. Moreover, not only are supplies required in significant quantities statewide, but also demands may be high at specific locations. For example, pulp and paper mills in the northwestern counties, oil refineries in Contra Costa and Los Angeles Counties, and food processing plants in the Central Valley all require large quantities of water to manufacture their products.

With but few exceptions, the cost of water remains relatively insignificant in relation to other manufacturing expenses, and is not an appreciable deterrent to use. This observation from limited survey data seems to be borne out in a National Water Commission report which states that "the nationwide average water cost as a percent of gross income for selected industries was 0.59 percent for steel; 1.46 percent for paper; 1.45 percent for petroleum and 1.33 percent for chemicals."[2]

Today, the overriding incentive to conserve water stems from state and federal controls governing the quality of discharged process water. Here, an expense is also involved. Dischargers must pay the cost of treatment in public treatment facilities, and must provide their own treatment of waste water when discharging to navigable receiving waters or to areas where the potential for ground water pollution exists.

Where treatment costs are high, conservation becomes an essential consideration to manufacturers who use large quantities of water. Therefore, more and more industries have begun to recirculate and reuse their original water supplies. As a result, although the number of manufacturing operations increased from about 27,000 in 1960 to almost 30,000 in 1970, total fresh water intake for manufacturing has remained largely unchanged.

Many factors affect the quantities of water intake; possible recirculation, amounts consumptively used[3], and the quantities discharged, including (a) the quality and type of the raw material, (b) the design of a manufacturing plant, and (c) the introduction of more efficient industrial processes. Accordingly, two plants manufacturing almost identical products may have considerably different water requirements.

As an example of raw material differences, a plant producing sugar from cane may have different water requirements than one producing sugar from beets. To exemplify "b", efficient water use is now a more important consideration in the design of new industrial plants; formerly, especially where supplies were plentiful, efficient use was often disregarded. "C" is exemplified by the recent practice in lumber mills of supplanting pond storage of logs with sprinkled log decks, which not only use less water but also are cleaner.

1/ *"Urban water use" is also referred to as "municipal and industrial water use". The terms are interchangeable. Both refer to type of use, rather than place of use.*

2/ *Robert, Young et al., Economic Value of Water Concepts and Empirical Estimates, National Water Commission, 1972.*

3/ *Consumptive use is defined as water lost through evaporation or that actually incorporated into the product (intake less discharge).*

FIGURE I
MANUFACTURING CLASSIFICATIONS

Major Group Number	Classification
19	Ordnance and accessories
20	Food and kindred products
21	Tobacco manufacturers
22	Textile mill products
23	Apparel and other finished products made from fabrics and similar materials
24	Lumber and wood products, except furniture
25	Furniture and fixtures
26	Paper and allied products
27	Printing, publishing, and allied industries
28	Chemicals and allied products
29	Petroleum refining and related industries
30	Rubber and miscellaneous plastic products
31	Leather and leather products
32	Stone, clay, glass, and concrete products
33	Primary metal industries
34	Fabricated metal products, except ordnance, machinery, and transportation equipment
35	Machinery, except electrical
36	Electrical machinery, equipment, and supplies
37	Transportation equipment
38	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks
39	Miscellaneous manufacturing industries

(As listed under "Division D, Manufacturing", in the Standard Industrial Classification Manual (1967), Executive Office of the President, Bureau of the Budget, Office of Statistical Standards.)

Scope and Purpose of Study

This study reports the results of a statewide survey of water use by California manufacturers in 1970. The manufacturing categories represented in this report are shown in Figure 1.

The data gathered in this survey are intended to provide a uniform base from which public agencies and other organizations that plan and operate water distribution facilities can evaluate current water use practices and plan for future manufacturing water needs. In cooperation with the U. S. Army Corps of Engineers and the U. S. Bureau of Reclamation, the Department of Water Resources undertook the survey to examine such factors as the total annual amounts of water taken into industrial plants, the extent to which manufacturers are using recirculated water, quantities of processing water discharged, and the capability of using reclaimed water.

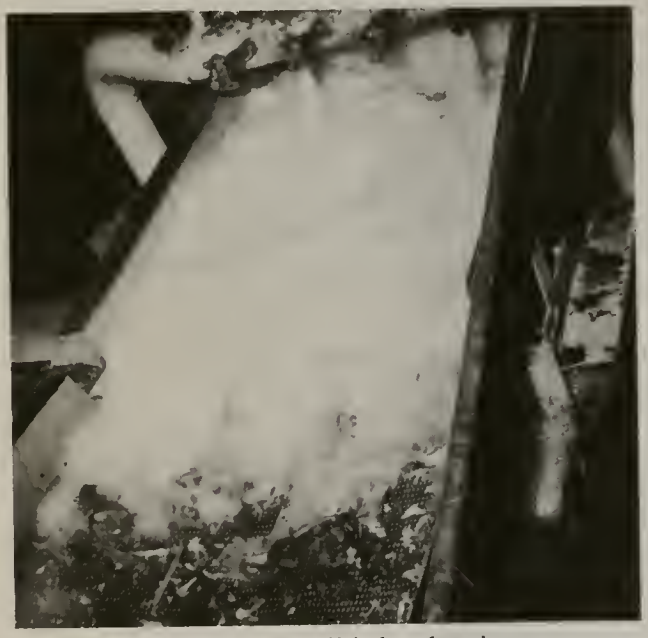
All California manufacturers that employ one or more persons were contacted during the survey[1/]. Advance notice was published by the California Manufacturing Association, and some 30,000 questionnaires were mailed in June 1971; in December 1971, 15,000 more were sent to the larger companies that had not responded to the June mailing. Completed, or partially completed, questionnaires were ultimately received from about 6,000 companies. These plants reported using 48 percent of the estimated 1 170 cubic hectometres (950,000 acre-feet) of total fresh water intake.

The tables in Chapter IV summarize the water use data as reported from the survey questionnaires; Tables 6 and 7 present estimated total fresh water use, which was derived by expanding the reported data.

Part of recirculation process in a steel mill. Water is treated in this circular clarifier prior to recirculation. *Courtesy of Kaiser Industries*

1/ Thus, about 10,000 small enterprises conducted by individual owners with no employees were excluded. These enterprises are believed to use less than 1 percent of the total water used for manufacturing.

Sprinkling log decks to preserve wood quality. Water is recirculated from the return-flow ditch (foreground).



Washing broccoli before freezing

Steam-cleaning equipment in a food-processing plant

Summary

In 1970, some 30,000 manufacturing plants operated in California. About 1 170 cubic hectometres (950,000 acre-feet) of fresh water per year is required to supply the needs of these plants.

Manufacturing water use has remained essentially the same between the 1957-59 period and 1970.

The industrial sector uses about 19 percent of the State's total urban fresh water. This level of consumption contrasts with the 30 percent needed in the 1957 through 1959 period.

Many plants require water only for sanitation and drinking; others use large quantities of water in the manufacturing process.

Over 317 cubic hectometres (258,000 acre-feet) of fresh water are estimated to be required by the major user group, the food industry.

Second in use is the pulp and paper industry, which uses 211 cubic hectometres (170,000 acre-feet), followed by petroleum refining, 208 cubic hectometres (169,000 acre-feet); chemicals, 99 cubic hectometres (80,000 acre-feet); lumber 83 cubic hectometres (68,000 acre-feet); stone, clay and glass, 57 cubic hectometres (47,000 acre-feet; and primary metals, 39 cubic hectometres (32,000 acre-feet).

The greatest single change in water use occurred in the wood products industry in which intake requirements declined from 262 cubic hectometres (213,000 acre-feet) in the late 1950s to 83 cubic hectometres (68,000 acre-feet) in 1970.

All other major industrial groups increased their water requirements except the chemical industry, which showed a slight decline.

Los Angeles County is first among counties in total annual fresh water use. San Francisco Bay Counties follow.

Plants with high water requirements are often located on bays and estuaries and on the ocean, where large quantities of brackish water are available. Most of these are in Contra Costa County; a smaller number are in Los Angeles, Monterey, Alameda, and San Mateo Counties.

In addition to the total estimated 1 170 cubic hectometres (950,000 acre-feet) of fresh water used by manufacturing industry, considerable quantities of brackish water are also used. No attempt was made to estimate the total amount of brackish water required; however, brackish water comprises 45 percent of the reported total water intake by manufacturers.

Cooling water continues to be the major application in manufacturing, followed by processing, boiler feed, employee use and sanitary requirements, and air conditioning.

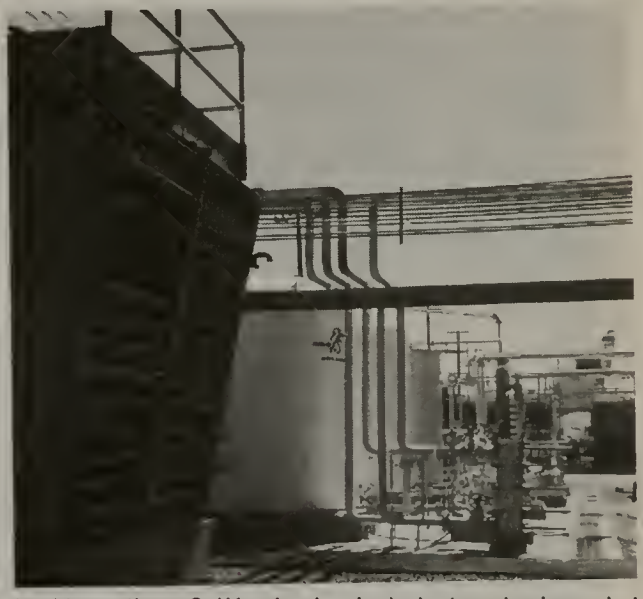
During the 12-year period 1958-1970, recirculation increased from about 2 times to about 6.7 times.

The consumptive use of water varies considerably among plants. The discharge-intake ratios vary from slightly more than 0.40 to over 0.95.

The attitude among manufacturers is that 55 percent of the intake water would be acceptable from reclaimed sources, providing quality and cost are equal to their present supply.

Fifty-six percent of the fresh water supply was reported to have been purchased from water service agencies and the remaining 44 percent was self-produced.

Water is used to cool steel beams in this cooling bed in a structural steel mill



In this northern California chemical plant, water is cooled in the tower (left foreground), conserving about 42,000 cubic metres (11 million gallons) daily.

Union Oil Company Refinery near Crockett, California

Chemical plant in Contra Costa County. The solar ponds (foreground) are used to reduce the volume of toxic industrial waste water by evaporation.

Chapter II. DATA BASE CHARACTERISTICS AND SURVEY PROCEDURES

All industries classified as manufacturers that were active in California during 1970 were contacted during the survey. The names and addresses of these manufacturers, and their employment statistics, were obtained from the California Department of Employment Development (EDD), which supplied (1) average midmonth employment data, by county, for each month in 1970, and (2) the Standard Industrial Classification Code Number[1/] assigned to each plant.

Because only partial response to the survey was obtained, some basis for expanding the sample results was needed to determine total water use. The basis selected was employment. On the basis of the information received from EDD, a unit rate of water use per employee was calculated; the rate could be easily applied to all persons known to be working in a specific industry in a specific county. Then, the unit rate calculated for each industry group was multiplied by the number of employees in the group.

This method was assumed to provide the most accurate measure of water use for a given industry group, and, for purposes of this survey, use was assumed to be relative to the size of the labor force. In other words, water use was considered proportional to the number of persons employed in each industry group, based on the quantity calculated for each employee.

Classifying industries as distinctly high or low water-using is impractical because there is no clear demarcation between those having high water requirements and those needing relatively little water. Per-employee rates of use may vary greatly from plants requiring high volumes of water for processing, cooling, and other major manufacturing uses to those that use water only for drinking and sanitation. A large plant with many workers, in which water is used principally for employee accomodation, may be seen as a high water user, even though no water is used for manufacturing. Other nonprocessing water uses include fire protection, landscape irrigation, cleaning and flushing, and dust control.

Many plants manufacture a variety of products, each of which is identified by a code number of the Standard Industrial Classification (SIC). For this study, the major product a plant manufactures determines the SIC code assigned to it. Where one company operates several plants, each plant has been assigned a code number to identify the major product it manufactures. Structure of the SIC system is described in Appendix D.

Large companies often set up sales offices, warehouses, and other business outlets that do not fit the manufacturing classification. To establish unit water use per employee, these fringe facilities were considered part of the manufacturing complex, and the employees working there were included in the total number of company employees. As stated earlier, the basis of the study procedure was to establish the location of water use by the place of employment. This necessitated some adjustment where office employees were

---

1/ *A system for classifying manufacturing industries -- presented in Division D of the Standard Industrial Classification Manual (1967 edition), prepared by the U. S. Office of Statistical Standards. See Appendix C. "Definitions of Manufacturing Industries."*

Chemical plant near Pittsburgh in Contra Costa County
courtesy of Dow Chemical

located in other counties. For example, in certain cases, such as the petroleum refining and canned fruits and vegetables industries, special attention was required to allocate water use to the county of actual use because many administrative and clerical offices were situated outside the counties of manufacture.

Small industrial plants that share space in large buildings present a special problem. Often one master meter serves the entire structure, and water use records for single users were inseparable from the total record of consumption. These data were deleted from the survey.

The difference in the estimated total fresh water use between Tables 6 and 7 resulted from the method of expanding respondent survey data. Table 6 was expanded, where possible, from data provided at the 3 and 4 digit Standard Industrial Classification level within each county. Only where no such data were available were statewide 3 and 4 digit employee unit use values used for expansion. In Table 7, however, only average statewide employee unit use values, at the 3 and 4 digit SIC levels, were used for expansion.

Replies to questions were received with varying degrees of success. Questions of an economic or internal nature were poorly responded to, while questions relating to water use and source were, for the most part, well answered. Some responses were inadequate because the questions were misunderstood or misinterpreted; these are not included in this report. Summaries of questions relating to product manufactured, costs, and future water requirements were

deleted from this report for the reasons stated above.

Answers to questions reported in Tables 1 through 9 are as follows:

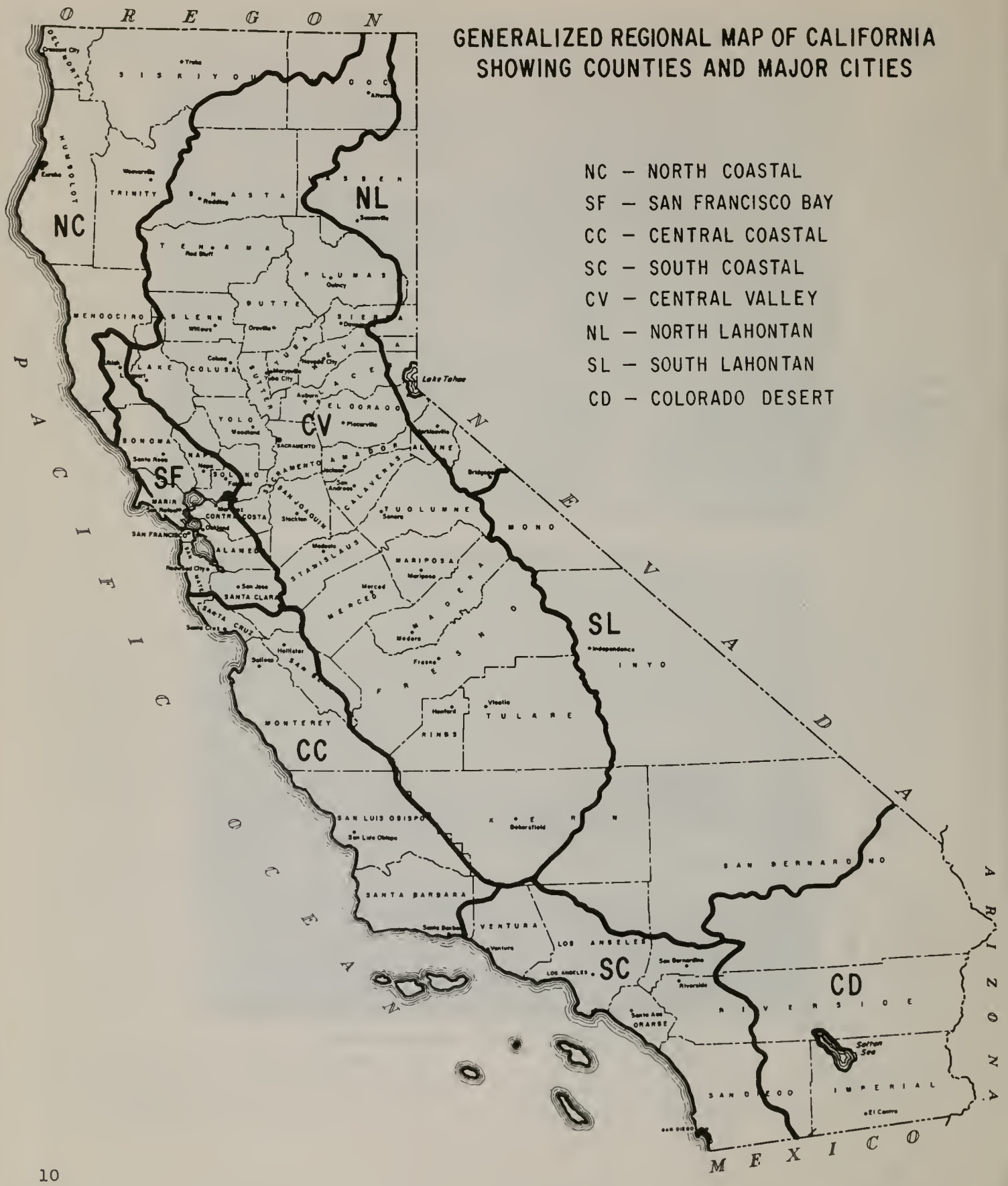
Table No.	Item	Percent Response
1	Reported Range of Water Use	18.4
2	Reported Water Use by Industry	18.4
3	Reported Water Use by County	18.4
4	Reported Type of Water Use	17.7
5	Reported Recirculation	18.0
5	Reported Discharge	13.3
6	Estimated Water Use by County	18.4
7	Estimated Water Use by Industrial Group	18.4
8	Reported Potential Acceptance of Reclaimed Water	10.1
9	Reported Source of Water	18.4

Responses, although appearing to be somewhat low, were received from plants using about 48 percent of the total fresh water intake requirements. As a general rule the larger plants and those using the most water provided the highest percentage of replies.

Linde Air Reduction Plant in Fontana, California

FIGURE 2

GENERALIZED REGIONAL MAP OF CALIFORNIA SHOWING COUNTIES AND MAJOR CITIES



Chapter III. GEOGRAPHIC SIGNIFICANCE OF CALIFORNIA MANUFACTURING INDUSTRIES

In many respects, California manufacturing tends to be regionalized; i.e., particular classes of industry are centered in certain areas of the State. For example, lumber mills are principally located in the North Coastal area, oil refineries are concentrated in the San Francisco Bay and North Coastal areas, and food processing plants are most prevalent in the Central Valley. The following discussion of manufacturing in the State indicates the principal types of industry located in eight regions of California, as shown in Figure 2.

North Coast

Lumbering and wood products manufacturing are the principal industries in the North Coastal area. Two large pulp mills are located on the Humboldt County coast, and numerous large lumber mills are located throughout each of the north coastal counties, including Humboldt, Del Norte, Trinity, Mendocino, Lake, Glenn, Siskiyou, and Modoc. A few establishments processing fish are located in Humboldt County, and a limited number of agriculturally oriented plants are situated in Siskiyou County.

San Francisco Bay

Nine counties front on San Francisco Bay. Manufacturing, however, is more heavily concentrated in the south and east bay counties of San Francisco, San Mateo, Santa Clara, Alameda, and Contra Costa, although it is beginning to expand into the northern counties of Solano, Napa, Sonoma, and Marin.

A number of factors have contributed to the growth and diversification of manufacturing in the Bay Area, including a temperate climate that allows efficient year-around operation, adequate water supplies, efficient rail, air, and highway transportation, adequate service by public utilities, and a large labor force. Population has risen from about 1.7 million in 1940 to 2.0 million in 1970, an 18 percent increase.

Each portion of the San Francisco Bay area has certain characteristics that set it apart from neighboring communities. San Francisco, in many respects, is the hub of the area, much as Los Angeles is the metropolitan center of Southern California. Manufacturing industries occupy an important part of the San Francisco economy, as measured by a census of industry employment and payroll. Almost 1,500 manufacturing units are located in San Francisco County, and space for additional development is now limited.

The San Mateo Peninsula, just south of San Francisco, has experienced a substantial increase in population and manufacturing. Many of the newer manufacturing plants are located in industrial parks, i.e., areas zoned for manufacturing or similar industries, and generally fall into the lighter water-using categories. Manufacturers of electronic and scientific instruments, and the like, are commonly found here. Photographs of this new type of industrial accommodation are shown on the following page. The acreage used for this purpose, or that zoned for future use, has increased many fold during the past two decades.

Santa Clara County has also experienced a very rapid expansion of population and manufacturing. The industrially used land appears continuous through San Mateo County and into Santa Clara County, with much the same type of

Industrial park in San Mateo County

manufacturing in each. The complex of manufacturing differs, however, in that the numerous long-established food-products plants in Santa Clara County tend to influence water use by their high water requirements.

Santa Clara County water requirements are substantial and are continuing to grow rapidly as the population increases. Although some water is imported, most is developed locally from wells. Underground supplies, however, are limited, and plans are in effect to import additional water.

Manufacturing in the Oakland metropoliran area, which includes the highly industrialized City of Emeryville, has been established for many years. There are slightly more than 1,500 manufacturing plants in Alameda County, of which approximately 325 are in the City of Oakland. Twenty-two industrial tracts and parks have been noted recently. Manufacturing in Alameda County is highly diversified, and many plants use large quantities of water for their operations. Contra Costa County also has a great concentration of diverse manufacturing establishments. Among these are major petroleum refining companies with exceptionally high water needs, a large part of which are met with brackish supplies from the south shores of San Pablo and Suisun Bays.

Some industrial expansion is occurring in the north bay counties of Marin, Sonoma, Napa, and Solano, but they are not so heavily industrialized as the south- and east-bay localities described in the preceding paragraphs. Some older types of manufacturing, including wineries in Napa and Sonoma Counties, have been in existence for many years.

Manufacturing is otherwise concentrated in and about the cities of Benicia, Vallejo, Napa, and San Rafael. New and diverse types are now becoming established in these areas.

Central Coast

In the north Central Coastal area, a number of food processors operate in or near Hollister and Gilroy. These include canneries and dehydrators. Other food processors, including produce freezers and fish canneries, are located on or near the coast near Santa Cruz, Watsonville, Moss Landing, and Salinas. A number of major wineries have now situated in the fertile Salinas Valley.

Petroleum storage is significant today south of San Luis Obispo and is continuing to enlarge. Storage and refinement of oil products will probably increase if plans for a deep-water port off Morro Bay are realized. Mining is also still important, particularly for mercury.

Industry in the Santa Maria area consists of food processing plants (washing, packing, and sugar beet processing). In addition, the number of electronic-oriented plants is increasing. Continued growth of the latter will probably depend on the level of activity at Vandenberg Air Force Missile Test Center in the adjoining basin to the south.

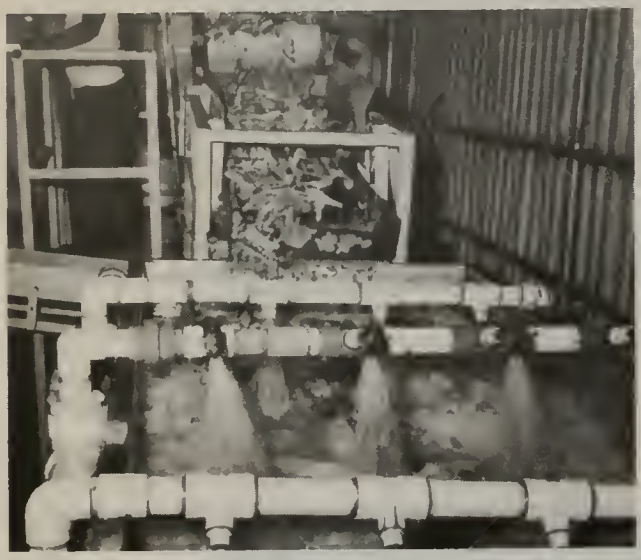
In Santa Barbara County, food processing plants, along with petroleum, ordnance, and electrical industries, dominate the industrial scene. Research and development facilities are also important. The biggest future in industry here lies with the petroleum industry, and new offshore wells, along with refineries, will probably be established.

South Coast

Industry in the Santa Clara River Valley area consists of petroleum, food processing, extraction (sand and gravel), scrap metal, and research and development activity. Oil well fields are extensive, along with refineries,

Industrial park in South San Francisco

Washing nectarines for fresh packaging



Washing vegetables before blanching, packaging, and freezing

Olive processing has high water requirements and generates large quantities of brine

and, in light of the fuel shortage, this industry should continue to grow. All types of vegetables and field crops are processed here; sugar beets are refined and lima beans are frozen and packaged. In addition, several fish canneries are located here. Recent years have seen a rapid increase in light manufacturing plants.

Los Angeles County is the hub of industrial activity in California. Industry is diversified and includes petroleum, chemicals, light manufacturing, paper, foundries, aerospace, shipyards, canneries, and other food processing industries. As in other areas, the petroleum industry is expected to grow. Some industrial areas, particularly some of the older light manufacturing areas, are run down and have a high vacancy factor. In many cases this has been caused by a movement of industry to industrial parks in suburban areas. Efforts are now being made to redevelop blighted industrial areas.

Heavy industry in the Santa Ana basin is best illustrated by Kaiser Steel in Fontana. The Kaiser plant has received world-wide attention because of its efficient use of water in manufacturing steel. Portland cement plants are extensive, along with sand and gravel operations. A few wineries are located here, along with other food processing industries such as those that serve the citrus industry. Chemical plants, including air reduction, are important, along with petroleum (wells and refineries), clay mining for bricks, railroad repair and switchywards, aerospace, food processing -- including sugar beet refineries -- and extensive light manufacturing and research and development. This area has grown rapidly over the years and industry has greatly increased. Large industrial parks are numerous, and industrial growth continues in step with population gains.

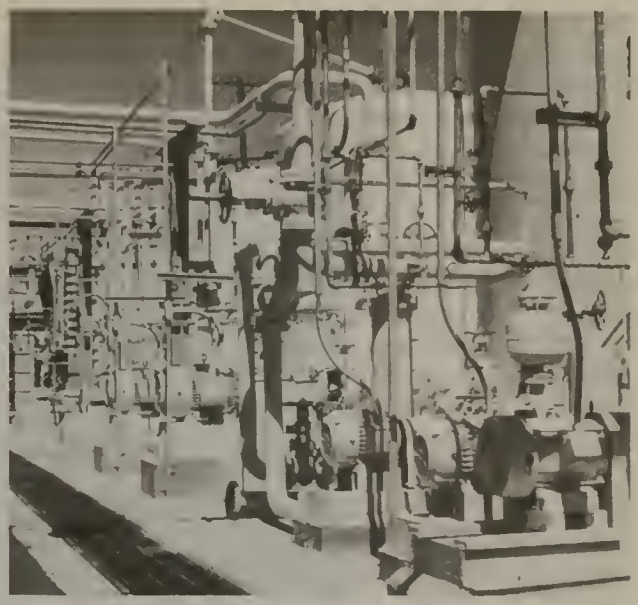
In San Diego County, one of the most rapidly developing Southern California areas, major industrial activity is oriented around electronics, medical health and life sciences, food processing, oceanography, apparel, and research and development. Also important are transportation and the aerospace industry. Salt evaporation ponds are still located in the San Diego Bay area, and mining is still important in some of the rural areas. Extensive areas zoned for industrial parks are filling rapidly with enterprises devoted to research and development, food processing, and light manufacturing. The port facilities continue to be important, and a new cannery (Van Camp) has recently been moved here from the Los Angeles area. In addition, there appears to be a rise in shipbuilding.

South Lahontan

Industrial development in the Mono-Owens Valley is sparse and primarily consists of the mining of tungsten, talc, pumice, and other minerals, including salt extraction from evaporative ponds. Mining predominates in the desert region of California but, although mentioned in the following discussion, is not included in the data in the tables in Chapter IV. Manufacturing growth is not anticipated.

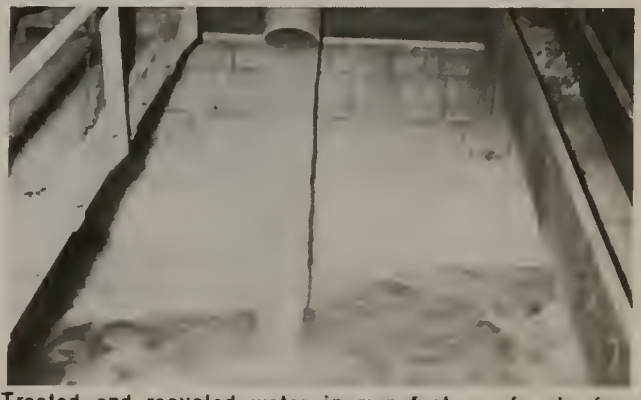
Death Valley mining -- mainly tungsten, gold, lead, and borates -- is a principal industry in the South Lahontan area. Much of the mining is carried on without extensive use of water. Ore is shipped to other areas for processing and manufacturing into primary metals and other basic materials.

Some research and development is conducted at the Naval Ordnance Test Station at China Lake. In this same area, south of Little Lake, is a large lumber mill, where stacked logs are sprayed continuously to reduce fire hazard and to preserve wood quality.



Water is used extensively in this closed system of a chemical plant – *Courtesy of Dow Chemical*

Water is softened before use in a recirculation system in a California steel mill. Softening is one of many operations in the raw-water treatment plant.



Treated and recycled water in manufacture of pulp for paper

The logs are constantly sprinkled to maintain an atmosphere of high humidity, which is required to prevent a blue fungus from spreading throughout the wood and to prevent the wood from drying and splitting (checking).

The Antelope Valley has a thriving aircraft industry, along with Portland cement and chemical factories. Mining is still important in the area, also. There could be significant industrial growth in the Antelope Valley if the intercontinental airport is constructed. This would probably result in the development of extensive light manufacturing industries and transportation support facilities. Antelope Valley is also the center of large concentrations of sands and gravels -- still untapped but with great potential considering the probable need for construction.

Portland cement is manufactured in the Mojave River area. Other industries include mining, and sand and gravel extraction. The area also has extensive military storage and distribution facilities. However, extensive growth of industry is not anticipated.

Colorado Desert

Industry in the Twenty-Nine Palms-Lanfair area is relatively minor, with limited activity related to mining and salt extraction from chloride deposits.

Kaiser's Eagle Mountain iron-ore mining operation is located in the Chuckwalla area. Mines are extensive throughout the area, but most are small operations. Some mining is carried on in the Colorado River area, along with some ornamental rock quarrying.

Bleaching and washing process in the reduction of wood chips to pulp for manufacturing paper

Cooling broccoli after blanching prior to packaging and freezing

Washing and moisturizing raisins

The food prcessing industry in the Coachella Valley is important. Fresh produce is washed, packed, and shipped to many areas throughout the United States. The area has a potential for the growth of light industry, which could be stimulated by the rapid urban development occurring between Palm Springs and Indio.

The Imperial Valley has extensive produce processing plants, including large sugar beet refineries. There are canneries, freezing plants, cotton gin mills and food processing plants. In addition, there are some salt works and a chemical plant that produces agricultural chemicals.

Central Valley

Numerous industries in the Central Valley use large quantities of water. These principally comprise plants processing agricultural products -- sugar, fruits, vegetables, and nuts -- and beef and dairy products. Other industries, e.g., manufacturers of agricultural implements, use smaller quantities of water. In addition to food processing, the Sacramento Basin portion of the Valley has a large wood products industry, including a paper mill at Anderson and widely dispersed lumber mills.

In Sacramento and San Joaquin Counties, alone, there are some 600 manufacturing

plants. Manufacturing in the Sacramento Valley is quite diversified, while San Joaquin Valley industry, particularly in the Fresno and Stockton areas, is oriented somewhat more directly to food processing, where manufacturers produce items from agriculture or items needed in the pursuit of agriculture.

Lumbering is the principal manufacturing industry in the Central Valley foothill areas, but is relatively minor compared with other types of manufacturing on the Valley floor.

Industry in the Delta area is almost entirely agriculturally oriented, with production, processing, packaging, and distribution of many diverse food products. Agriculture itself is located in the rich delta area of the Sacramento and San Joaquin Rivers extending eastward to the Sierra foothills. The industrial activities supportive of agriculture are centered in the Stockton area, including considerable fabrication, sales, and repair of farm implements.

North Lahontan

With the exception of a limited amount of lumbering in the Susanville and Sierra Valley areas, very little manufacturing is carried out in the North Lahontan area, a small region in northeastern California. The area, which includes the Lake Tahoe Basin, is principally devoted to recreation.

Vats for olive curing are filled with brine

Chapter IV. DATA ANALYSIS AND SUMMARY

The following analyses are based on information submitted by manufacturers responding to the questionnaire.

Overall water use by the State's manufacturers is now about 1 170 cubic hectometres (950,000 acre-feet) -- up only slightly from the 1957 through 1959 period. Probable reasons for the minimum increase are the greatly reduced water use by lumber mills, lower use in the chemical industry in 1970, and the increased recycle rate throughout industry.

The nine leading manufacturing groups in order of volume of water use are: (1) food products, (2) petroleum refining, (3) pulp and paper, (4) chemicals, (5) wood products, (6) stone, clay, and glass products, (7) primary metals, (8) transportation equipment and (9) fabricated metals. All use in excess of 34 cubic hectometres (27,000 acre-feet) per year. This sequence involves two significant changes in the order of use since the 1957-1959 survey, which found wood products second and petroleum refining third.

The tables in this report are arranged somewhat similarly to those in Bulletin No. 124, "Water Use by Manufacturing Industries in California, 1957-1959", published in 1964. Table 1 presents the range of water use for reporting plants within each of the industry groups. Tables 2 and 3 show reported water-use data of responding plants. Data is related to industry group in Table 2, while Table 3 presents water use by county. Table 4 reports data on types of water use within the plant, and Table 5 reports recirculation and water discharged by industry group.

Table 6 shows estimated total water use for manufacturing, by county and industry group, based on expansion of the reported data in the previously described tables. Table 7 contains estimated total water use of major industry groups and includes unit water use per employee, from which estimates of total use were computed. Table 8 shows potential degree of acceptance of reclaimed water by industrial groups, and Table 9 shows reported water use by source.

Approximately 4 percent of the plants reporting used at least 81 percent of the total reported water intake (Table 1). Thirty-one plants reported more than 4 cubic hectometres (3,000 acre-feet), while the greatest number of plants fell within the range of 378 to 3 780 cubic metres (100,000 to 1 million gallons).

In making these estimates, the midpoint value of each range of water use was assumed to represent the annual gross intake of each of the plants falling within that range. For example, column 5 includes the number of plants which use between 100 million and 1 billion gallons per year. For calculation purposes, a midpoint value of 2 cubic hectometres (1,700 acre-feet) was assumed to be the annual gross intake of each of the plants falling within the range of this column.

The food industry (SIC No. 20) continues to lead all others in water intake requirements (Figure 3 and Table 2), having increased 13 percent since 1960. Canning and frozen food processers still account for the greatest use in this industry. The increase in water use is somewhat commensurate with the State's agricultural production growth during the past 15 years.

Petroleum refining is now the second largest industrial water user, moving from third place in 1960. Water use has risen nearly 15 percent. Again, this increase seems to be directly associated with the ever-increasing demand for fuel to power vehicles and

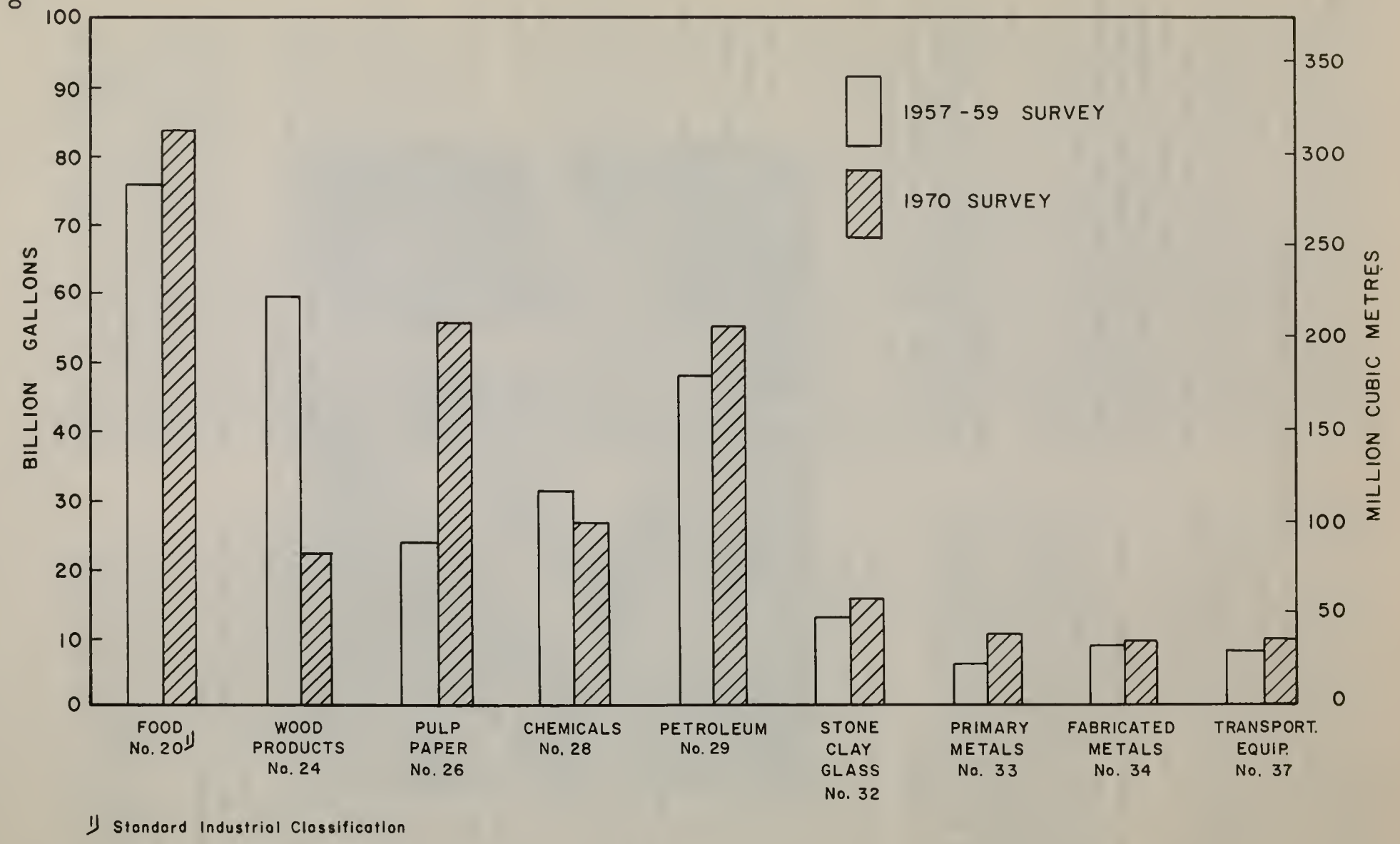


FIGURE 3. ESTIMATED TOTAL ANNUAL WATER USE BY MAJOR WATER-USING MANUFACTURING INDUSTRIES

for electrical power generation in both California and elsewhere in the nation. A further stimulation in petroleum refining may be attributed to the other uses for petroleum products, particularly in synthetic fabrics and for plastics. In the total petroleum industry, water use for petroleum refining, by far, exceeds that for other petroleum products.

Water use in paper and pulp manufacturing (SIC No. 26) has increased significantly (233 percent) between the 1957-1959 period and 1970. Along with lumber production, the pulp and paper industry is now mainly responsible for the high industrial water requirements in Northern California. Four mills in this region, using waste wood from lumber and plywood mills, account for almost half of the State's paper production. A comparable quantity of water is required for processing.

The chemical industry (SIC No. 28) remains in fourth position among the industries; however, water intake requirements have declined more than 15 percent for the industry as a whole. It can be speculated that impending pollution control constraints in 1970 encouraged developments of recycling facilities and further treatment of effluent.

There are also indications that the decline in the national economy contributed to a lessening in demand for certain groups of chemicals, such as paint. By contrast, the demand for agricultural chemicals more than doubled in little over a decade, and the demand for soaps and cosmetics also showed substantial increases.

As indicated, severe declines in water use were experienced by the wood products industry, which changed its standing from second to fifth place among industries (SIC No. 24). Two factors may be chiefly responsible. First, the slow-down in the building industry had a direct effect on the need for lumber. Secondly, the relatively new practice of sprinkling log decks, in lieu of using mill ponds for storing and preserving logs, has also contributed to the declining requirement. Where logs are stored over impervious soil, return flow systems are employed to recycle intake water many times and thus to reduce make-up water requirements.

Lumber mills continue to dominate the wood products industry in water use, but mills vary considerably in rate of water use. Respondents apparently interpreted the term "water use" differently. Water use defined as intake water[1/], rather than consumptive use or gross use[1/], is most easily understood, but "flow-through" water into, and out of, ponds is considered "water use" by some respondents. The previous survey included a few mills with exceptionally high use, very close to total streamflow.

As a result of log deck sprinkling (resulting in a lessening of "in stream" millpond use), construction decline, and possibly other factors, the wood products industry experiences a 70 percent decrease in water requirements in comparison to the boom construction years of the 1950s.

In the industrial group of stone, clay, and glass products, (SIC No. 32) glass and glassware showed nearly a tripling of water use. Water used in hydraulic cement manufacture also increased, but there was a drop-off in water use for cement, gypsum, and plaster products -- again a possible reflection of the decline in our economy during 1970. Overall increase in this industry, as indicated by level of water use, was 18 percent.

Water use in the primary metals industry (SIC No. 33) continues to be dominated by the blast furnace and basic steel products, which show a rise of more than 70 percent. Rolling and drawing of nonferrous metals, although initially lower in water use, showed even a more

1/ *See Definition of Terms, Appendix D.*

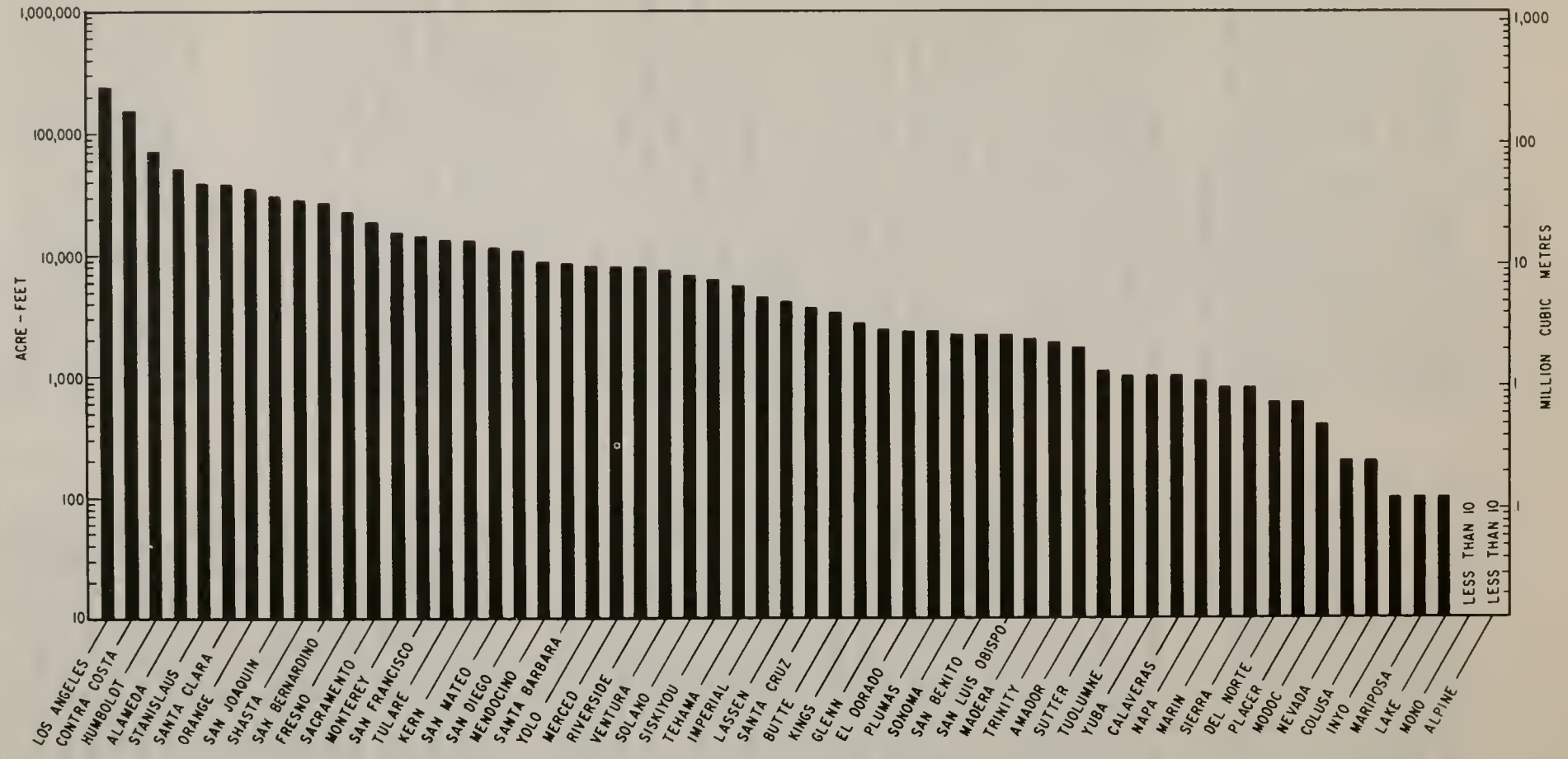


FIGURE 4. ESTIMATED TOTAL ANNUAL FRESH WATER USE BY COUNTY — 1970

dramatic increase of over 100 percent. When totaled, the group rose a substantial 70 percent during the past 12 years.

Because of sheer numbers of plants and employees, water use in fabricated metal products and transportation equipment industries (SIC 34 and 37) is at traditionally high levels. Each has increased slightly over the twelve years between surveys (fabricated metals about 4 percent, and transportation equipment 22 percent). Most water use in these industries is directly related to the level of employment, and little water is needed for processing, with the exception of the coating and engraving constituent (SIC No. 3471) of these groups, which requires great quantities of process water. Because of high employment in aircraft and parts manufacture, the group, as a whole, remains at a high level in water use.

The ranking of water use among the major industrialized counties followed somewhat the same sequential pattern during the past 12 years (Figure 4, and Tables 3 and 6) with two major changes. These changes are related to the new patterns of activity in wood products, and establishment of the large water-using paper-pulp plant located in Humboldt County. As mentioned previously, the use of water for wood products declined significantly because of a slowdown in home construction. This and other factors were probably responsible for a reduction in water use by Plumas County, which previously had been the second highest industrial-water-using county in the State. In most instances where total county industrial water use declined over the past decade in the northern counties, the cause can be traced to either a reduction in timber cutting or a change to log-deck sprinkling in place of mill ponds.

Some of the differences in data presented in this report and that in Bulletin No. 124 resulted from use of inadequate employment data for 1957 through 1959, which, in the earlier study, located employees in "headquarter" counties rather than the county in which the employees were actually working. Since total water use is computed from the employee unit rates determined from the survey samples, and from data on the total numbers of employees, care must be taken that the location of employees is known. In the Bulletin No. 124 study, in a few cases, all employees of a company with facilities at various locations were erroneously considered to be located at the "headquarter" office. For example, petroleum-refining employees were erroneously shown to be located in San Francisco County and an equivalent quantity of water was inadvertently assigned to this area. These data were adjusted after publication of the earlier report, (Bulletin No. 124 -- April 1964).

The responses to the survey question asking for quantities of intake water used for various purposes within the plant, including cooling, processing, boiler feed, air conditioning, sanitary and drinking, and "other" (as reported in Table 4) show that 57 percent is used for cooling, largely because of the high demands for petroleum refining. Some 30 percent of the total intake is used for processing; thus, these two categories account for about 87 percent of the total water intake. Without the high cooling-water requirement for petroleum refining, cooling and processing would require about the same amount of water.

Of the remaining water intake reported, both fresh and brackish, 6 percent is used for boiler feed; 3 percent for "other" miscellaneous purposes (such as factory and service-road dust suppression, fire protection, and esthetics); 2 percent for sanitary and drinking; and 2 percent for air conditioning.

Table 5 shows recirculation and discharge. With a few exceptions, recirculation, as expected, was higher in the "heavy" industries, which use large amounts of process water. In several cases it may be noted that air conditioning water was extensively recirculated in "light" industry, where close plant temperature control was necessary for sensitive processes and for employee comfort.

Consumptive use of water varies considerably among industries (Table 5). Plants using water mainly for employee comfort may discharge nearly as much water as is received as intake unless air-conditioning evaporative losses are high. Elsewhere, where recycling is extensively practiced, or where processing and cooling are important water-use functions, the discharge-intake ratios[1/] are understandably lower.

The weighted discharge-intake ratio for the State, including all industrial groups, is 0.69. Rates among industry groups vary from slightly more than 0.40 to over 0.95.

When water quality is unimpaired or where the water can be made acceptable for reuse, plants with a high discharge-intake ratio would seem to have a high reuse potential.

Table 8 shows the attitude of manufacturers toward the use of reclaimed water and potential acceptance of this resource in the manufacturing process. Overall acceptance equalled 55 percent of the total intake. This figure was determined by calculating that portion of the total reported fresh intake water that manufacturers indicated they would accept from reclaimed water sources.

The following table shows the willingness of various industrial groups to use reclaimed water as a part of the intake supply.

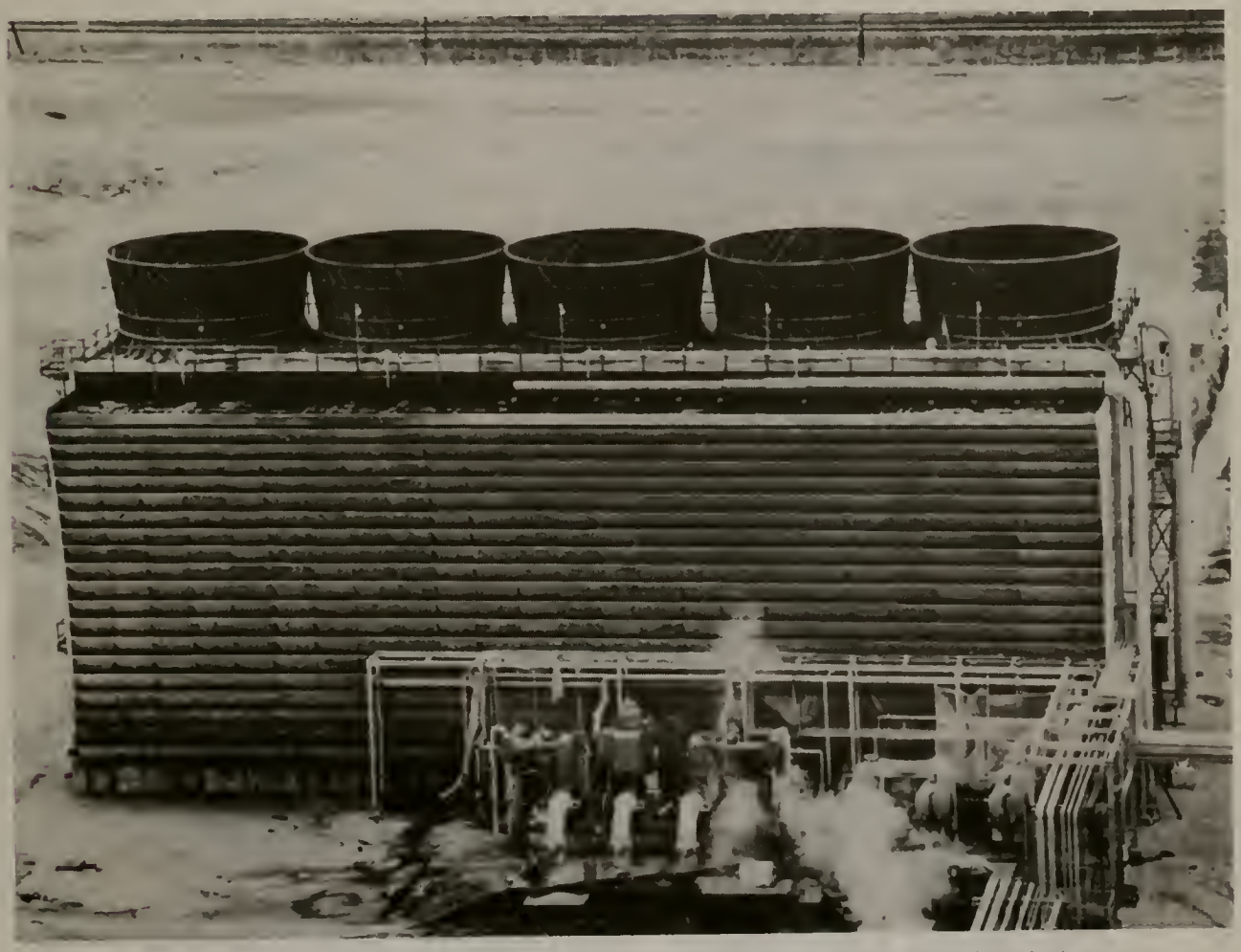
Industry Classification	Percent Acceptance	Industry Classification	Percent Acceptance
Ordnance	53	Petroleum refining	37
Food	63	Rubber and plastic	84
Tobacco	No response	Leather	21
Textile mills	55	Stone, Clay, Glass	67
Apparel	16	Primary metals	44
Lumber and Wood	58	Fabricated metals	67
Furniture	12	Machinery	35
Paper	74	Electric machinery	51
Printing, Publishing	32	Transportation equipment	47
Chemicals	73	Instruments	78
		Miscellaneous	48

Manufacturing industry (weighted) average - 55

1/ *The discharge-intake ratio is the proportion of plant intake water discharged as effluent.*

Most manufacturing water derived from a single source is self-developed from brackish bays, estuaries, wells, and the ocean (Table 9). The largest source of fresh water (31 percent) is that purchased from water agencies, which derive their supplies from a variety of primary sources. Almost 18 percent of the fresh water supply is self-developed from wells and springs, and a little more than 6 percent is obtained directly from stream diversion. Only a very small fraction of 1 percent is self-developed from lakes.

In the manufacturing industry as a whole, 55 percent of all water used is fresh, and the remainder (45 percent) is brackish.



Cooling towers used to cool heated water in a refinery. Refining crude oil requires both high pressures and high temperatures. The cooling towers dissipate the heat into the atmosphere safely and harmlessly.

TABLE 1

RANGE OF REPORTED ANNUAL WATER USE BY INDUSTRY GROUP IN 1970

(MILLION GALLONS)

1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	TOTAL NO. OF PLANTS	PLANTS REPORTING WATER INTAKE						
			TOTAL	GROSS INTAKE IN MILLION GALLONS PER YEAR					
				UNDER 0.1	0.1 - 1	1 - 10	10 - 100	100 - 1000	OVER 1000
190	ORDNANCE AND ACCESSORIES	54	9	1	2	1	2	3	0
191	GUNS, HOWITZERS AND MORTARS	1							
192	AMMUNITION, EXCEPT FOR SMALL ARMS	29	4	0	1	0	1	2	0
193	TANKS AND TANK COMPONENTS	1	3	0	0	1	1	1	0
194	SIGHTING AND FIRE CONTROL EQUIPMENT	1							
195	SMALL ARMS	11	1	0	1	0	0	0	0
196	SMALL ARMS AMMUNITION	6	1	1	0	0	0	0	0
199	ORDNANCE AND ACCESSORIES, NEC	5							
200	FOOD AND KINDRED PRODUCTS	2461	601	39	151	175	152	76	8
201	MEAT PRODUCTS	315	79	2	19	29	23	6	0
202	DAIRY PRODUCTS	278	53	3	12	16	16	6	0
203	CANNED, CURED, AND FROZEN FOODS	508	129	4	22	26	32	44	1
204	GRAIN MILL PRODUCTS	221	59	7	28	15	7	2	0
205	BAKERY PRODUCTS	241	42	7	17	13	5	0	0
206	SUGAR	18	7	0	0	0	0	2	5
207	CONFECTIONERY AND RELATED PRODUCTS	119	28	4	8	11	4	0	1
208	BEVERAGES	332	96	8	16	27	34	10	1
209	MISC. FOODS AND KINDRED PRODUCTS	429	108	4	29	38	31	6	0
210	TOBACCO MANUFACTURES	4							
211	CIGARETTES	1							
212	CIGARS	3							
220	TEXTILE MILL PRODUCTS	252	52	4	37	6	5	0	0
221	WEAVING MILLS, COTTON	6							
222	WEAVING MILLS, SYNTHETICS	5	1	0	1	0	0	0	0
223	WEAVING AND FINISHING MILLS, WOOL	11	1	0	0	1	0	0	0
224	NARROW FABRIC MILLS	13	3	0	2	1	0	0	0
225	KNITTING MILLS	71	8	0	6	1	1	0	0
226	TEXTILE FINISHING, EXCEPT WOOL	24	3	0	1	0	2	0	0
227	FLOOR COVERING MILLS	52	13	1	9	1	2	0	0
228	YARN AND THREAD MILLS	8	2	0	2	0	0	0	0
229	MISCELLANEOUS TEXTILE GOODS	62	21	3	16	2	0	0	0
230	APPAREL AND OTHER TEXTILE PRODUCTS	2183	250	30	209	10	1	0	0
231	MEN'S AND BOYS' SUITS AND COATS	28	6	0	6	2	0	0	0
232	MEN'S AND BOYS' FURNISHINGS	186	26	1	22	3	0	0	0
233	WOMEN'S AND MISSES' OUTERWEAR	1202	127	13	113	1	0	0	0
234	WOMEN'S AND CHILDREN'S UNDERGARMENTS	55	7	1	6	0	0	0	0
235	HATS, CAPS, AND MILLINERY	30	1	1	0	0	0	0	0
236	CHILDREN'S OUTERWEAR	46	7	1	6	0	0	0	0
237	FUR GOODS	28	2	0	2	0	0	0	0
238	MISCELLANEOUS APPAREL AND ACCESSORIES	71	11	2	8	1	0	0	0
239	MISC. FABRICATED TEXTILE PRODUCTS	537	61	11	46	3	1	0	0
240	LUMBER AND WOOD PRODUCTS	1608	277	38	186	22	20	9	2
241	LOGGING CAMPS, + LOGGING CONTRACTORS	442	40	4	31	4	1	0	0
242	SAWMILLS AND PLANING MILLS	267	71	1	31	13	17	7	2
243	MILLWORK, PLYWOOD + RELATED PRODUCTS	423	94	17	74	2	1	0	0

TABLE 1 (Continued)

RANGE OF REPORTED ANNUAL WATER USE BY INDUSTRY GROUP IN 1970

(MILLION GALLONS)

1 MILLION GALLONS 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	TOTAL NO. OF PLANTS	PLANTS REPORTING WATER INTAKE						
			TOTAL	GROSS INTAKE IN MILLION GALLONS PER YEAR					
				UNDER 0.1	0.1 - 1	1 - 10	10 - 100	100 - 1000	OVER 1000
244	WOODEN CONTAINERS	134	14	3	10	0	1	0	0
249	MISCELLANEOUS WOOD PRODUCTS	342	58	13	40	3	0	2	0
250	FURNITURE AND FIXTURES	1258	207	24	166	14	2	1	0
251	HOUSEHOLD FURNITURE	825	131	13	110	7	0	1	0
252	OFFICE FURNITURE	57	10	2	3	4	1	0	0
253	PUBLIC BUILDING FURNITURE	26	6	1	3	1	1	0	0
254	PARTITIONS AND FIXTURES	253	41	4	36	1	0	0	0
259	MISCELLANEOUS FURNITURE AND FIXTURES	97	19	4	14	1	0	0	0
260	PAPER AND ALLIED PRODUCTS	470	156	13	70	38	18	10	7
261	PULP MILLS	3	1	0	0	0	0	0	1
262	PAPER MILLS, EXCEPT BUILDING PAPER	9	6	0	0	0	1	3	2
263	PAPERBOARD MILLS	14	6	0	0	0	1	2	3
264	MISC. CONVERTED PAPER PRODUCTS	230	82	5	45	26	2	3	1
265	PAPERBOARD CONTAINERS AND BOXES	207	60	7	25	12	14	2	0
266	BUILDING PAPER AND BOARD MILLS	7	1	1	0	0	0	0	0
270	PRINTING AND PUBLISHING	3735	455	87	321	37	10	0	0
271	NEWSPAPERS	501	72	10	45	14	3	0	0
272	PERIODICALS	258	19	0	18	1	0	0	0
273	BOOKS	149	18	3	14	0	1	0	0
274	MISCELLANEOUS PUBLISHING	259	29	3	24	1	1	0	0
275	COMMERCIAL PRINTING	2119	255	61	179	11	4	0	0
276	MANIFOLD BUSINESS FORMS	49	12	1	5	6	0	0	0
277	GREETING CARD PUBLISHING	24	2	0	2	0	0	0	0
278	BLANKBOOKS AND BOOKBINDING	147	21	5	13	2	1	0	0
279	PRINTING TRADE SERVICES	229	27	4	21	2	0	0	0
280	CHEMICALS AND ALLIED PRODUCTS	1157	383	49	164	92	46	26	6
281	INDUSTRIAL CHEMICALS	169	77	6	20	19	11	15	6
282	PLASTICS MATERIALS AND SYNTHETICS	86	41	4	15	13	7	2	0
283	DRUGS	140	36	7	15	8	5	1	0
284	SOAP, CLEANERS, AND TOILET GOODS	271	81	14	40	15	9	3	0
285	PAINTS AND ALLIED PRODUCTS	204	66	11	36	13	6	0	0
286	GUM AND WOOD CHEMICALS	4	1	0	0	1	0	0	0
287	AGRICULTURAL CHEMICALS	98	34	4	15	8	4	3	0
289	MISCELLANEOUS CHEMICAL PRODUCTS	185	47	3	23	15	4	2	0
290	PETROLEUM AND COAL PRODUCTS	230	54	3	7	11	13	13	7
291	PETROLEUM REFINING	135	31	0	2	4	7	11	7
295	PAVING AND ROOFING MATERIALS	56	12	2	2	2	4	2	0
299	MISC. PETROLEUM AND COAL PRODUCTS	39	11	1	3	5	2	0	0
300	RUBBER AND PLASTICS PRODUCTS, NEC	961	198	33	111	45	7	2	0
301	TIRES AND INNER TUBES	26	9	1	0	2	4	2	0
302	RUBBER FOOTWEAR	2							
303	RECLAIMED RUBBER	3							
306	FABRICATED RUBBER PRODUCTS, NEC	145	20	2	13	5	0	0	0
307	MISCELLANEOUS PLASTICS PRODUCTS	785	169	30	98	38	3	0	0

TABLE 1 (Continued)

RANGE OF REPORTED ANNUAL WATER USE BY INDUSTRY GROUP IN 1970

(MILLION GALLONS)

1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	TOTAL NO. OF PLANTS	PLANTS REPORTING WATER INTAKE						
			TOTAL	GROSS INTAKE IN MILLION GALLONS PER YEAR					
				UNDER 0.1	0.1 – 1	1 – 10	10 – 100	100 – 1000	OVER 1000
310	LEATHER AND LEATHER PRODUCTS	205	38	2	31	1	2	2	0
311	LEATHER TANNING AND FINISHING	18	4	0	0	0	2	2	0
312	INDUSTRIAL LEATHER BELTING	7	1	0	1	0	0	0	0
313	FOOTWEAR CUT STOCK	9	2	0	2	0	0	0	0
314	FOOTWEAR, EXCEPT RUBBER	50	8	0	8	0	0	0	0
315	LEATHER GLOVES AND MITTENS	9	1	0	1	0	0	0	0
316	LUGGAGE	27	7	1	6	0	0	0	0
317	HANDBAGS AND PERSONAL LEATHER GOODS	50	7	1	5	1	0	0	0
319	LEATHER GOODS, NEC	35	8	0	8	0	0	0	0
320	STONE, CLAY, AND GLASS PRODUCTS	1146	255	35	106	71	32	11	0
321	FLAT GLASS	7	2	0	0	1	0	1	0
322	GLASS AND GLASSWARE, PRESSED OR BLOWN	61	15	0	5	1	7	2	0
323	PRODUCTS OF PURCHASED GLASS	99	16	11	4	1	0	0	0
324	CEMENT, HYDRAULIC	22	5	0	1	0	2	2	0
325	STRUCTURAL CLAY PRODUCTS	61	14	1	6	5	2	0	0
326	POTTERY AND RELATED PRODUCTS	143	20	2	13	2	3	0	0
327	CONCRETE, GYPSUM, AND PLASTER PRODUCTS	526	128	10	46	55	13	4	0
328	CUT STONE AND STONE PRODUCTS	38	3	0	1	2	0	0	0
329	MISC. NONMETALLIC MINERAL PRODUCTS	189	52	11	30	4	5	2	0
330	PRIMARY METAL INDUSTRIES	711	193	20	94	50	31	7	1
331	BLAST FURNACE AND BASIC STEEL PRODUCTS	103	31	6	7	4	9	4	1
332	IRON AND STEEL FOUNDRIES	106	33	3	11	14	5	0	0
333	PRIMARY NONFERROUS METALS	10	2	0	1	0	1	0	0
334	SECONDARY NONFERROUS METALS	35	8	0	2	2	4	0	0
335	NONFERROUS ROLLING AND DRAWING	97	29	2	8	7	8	3	0
336	NONFERROUS FOUNDRIES	233	57	7	39	11	0	0	0
339	MISCELLANEOUS PRIMARY METAL PRODUCTS	127	34	2	16	12	4	0	0
340	FABRICATED METAL PRODUCTS	3125	645	119	377	105	39	5	0
341	METAL CANS	46	20	1	5	10	3	1	0
342	CUTLERY, HAND TOOLS, AND HARDWARE	279	61	12	42	4	3	0	0
343	PLUMBING AND HEATING, EXCEPT ELECTRIC	106	19	6	8	5	0	0	0
344	FABRICATED STRUCTURAL METAL PRODUCTS	1129	221	49	150	16	5	1	0
345	SCREW MACHINE PRODUCTS, BOLTS, ETC.	216	42	12	23	3	4	0	0
346	METAL STAMPINGS	230	45	7	32	4	2	0	0
347	METAL SERVICES, NEC	701	131	12	57	45	15	2	0
348	MISC. FABRICATED WIRE PRODUCTS	177	49	9	31	7	1	1	0
349	MISC. FABRICATED METAL PRODUCTS	241	57	11	29	11	6	0	0
350	MACHINERY, EXCEPT ELECTRICAL	4518	750	174	496	61	15	4	0
351	ENGINES AND TURBINES	30	5	2	1	1	1	0	0
352	FARM MACHINERY	148	34	11	22	0	1	0	0
353	CONSTRUCTION AND RELATED MACHINERY	267	53	4	38	11	0	0	0
354	METAL WORKING MACHINERY	792	122	29	83	8	1	1	0
355	SPECIAL INDUSTY MACHINERY	261	70	12	46	8	4	0	0
356	GENERAL INDUSTRIAL MACHINERY	377	68	14	47	5	1	1	0

TABLE 1 (Continued)

RANGE OF REPORTED ANNUAL WATER USE BY INDUSTRY GROUP IN 1970

(MILLION GALLONS)

1 MILLION GALLONS 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	TOTAL NO OF PLANTS	PLANTS REPORTING WATER INTAKE						
			TOTAL	GROSS INTAKE IN MILLION GALLONS PER YEAR					
				UNDER 0.1	0.1 - 1	1 - 10	10 - 100	100 - 1000	OVER 1000
357	OFFICE AND COMPUTING MACHINES	213	45	2	24	13	4	2	0
358	SERVICE INDUSTRY MACHINES	150	33	6	19	5	3	0	0
359	MISC. MACHINERY, EXCEPT ELECTRICAL	2280	320	94	216	10	0	0	0
360	ELECTRICAL EQUIPMENT AND SUPPLIES	2043	361	49	215	71	24	2	0
361	ELECTRIC TEST + DISTRIBUTING EQUIPMENT	200	43	4	30	9	0	0	0
362	ELECTRICAL INDUSTRIAL APPARATUS	150	34	6	20	6	1	1	0
363	HOUSEHOLD APPLIANCES	63	5	0	3	0	1	1	0
364	ELECTRIC LIGHTING AND WIRING EQUIPMENT	298	46	8	27	10	1	0	0
365	RADIO AND TV RECEIVING EQUIPMENT	199	27	3	17	4	3	0	0
366	COMMUNICATION EQUIPMENT	313	64	8	35	13	8	0	0
367	ELECTRONIC COMPONENTS AND ACCESSORIES	715	122	16	75	23	8	0	0
369	MISC. ELECTRICAL EQUIPMENT + SUPPLIES	105	20	4	8	6	2	0	0
370	TRANSPORTATION EQUIPMENT	1633	283	37	171	39	23	13	0
371	MOTOR VEHICLES AND EQUIPMENT	384	76	15	50	6	4	1	0
372	AIRCRAFT THE PARTS	644	132	10	76	25	13	8	
373	SHIP AND BOAT BUILDING AND REPAIRING	285	30	5	12	3	6	4	0
374	RAILROAD EQUIPMENT	3	1	0	1	0	0	0	0
375	MOTORCYCLES, BICYCLES, AND PARTS	44	6	2	2	2	0	0	0
379	MISCELLANEOUS TRANSPORTATION EQUIPMENT	273	38	5	30	3	0	0	0
380	INSTRUMENTS AND RELATED PRODUCTS	769	130	22	84	15	9	0	0
381	ENGINEERING + SCIENTIFIC INSTRUMENTS	123	19	5	7	5	2	0	0
382	MECHANICAL MEASURING + CONTROL DEVICES	154	24	4	13	3	4	0	0
383	OPTICAL INSTRUMENTS AND LENSES	73	13	2	10	1	0	0	0
384	MEDICAL INSTRUMENTS AND SUPPLIES	221	40	7	28	3	2	0	0
385	OPHTHALMIC GOODS	69	9	1	8	0	0	0	0
386	PHOTOGRAPHIC EQUIPMENT AND SUPPLIES	120	24	3	17	3	1	0	0
387	WATCHES, CLOCKS, AND WATCHCASES	9	1	0	1	0	0	0	0
390	MISCELLANEOUS MANUFACTURING INDUSTRIES	1263	194	46	134	11	3	0	0
391	JEWELRY, SILVERWARE, AND PLATED WARE	158	24	6	18	0	0	0	0
393	MUSICAL INSTRUMENTS AND PARTS	31	3	0	2	0	1	0	0
394	TOYS AND SPORTING GOODS	313	40	9	27	2	2	0	0
395	PENS, PENCILS, OFFICE AND ART SUPPLIES	108	27	6	18	3	0	0	0
396	COSTUME JEWELRY AND NOTIONS	112	14	2	12	0	0	0	0
399	MISCELLANEOUS MANUFACTURES	541	86	23	57	6	0	0	0
	TOTAL	29786	5491	825	3122	875	454	184	31

TABLE 2

REPORTED ANNUAL WATER INTAKE BY INDUSTRY GROUP IN 1970

(MILLION GALLONS)
1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	NUMBER OF PLANTS		FRESH WATER		BRACKISH WATER	TOTAL INTAKE WATER
		TOTAL	REPORTING	PURCHASED	SELF PRODUCED		
190	ORDNANCE AND ACCESSORIES	54	9	706	0	0	706
191	GUNS, HOWITZERS AND MORTARS	1					
192	AMMUNITION, EXCEPT FOR SMALL ARMS	29	4	571	0	0	571
193	TANKS AND TANK COMPONENTS	1	3	133	0	0	133
194	SIGHTING AND FIRE CONTROL EQUIPMENT	1					
195	SMALL ARMS	11	1	*	0	0	*
196	SMALL ARMS AMMUNITION	6	1	*	0	0	*
199	ORDNANCE AND ACCESSORIES, NEC	5					
200	FOOD AND KINDRED PRODUCTS	2461	601	12159	24705	7879	44743
201	MEAT PRODUCTS	315	79	1299	935	0	2235
202	DAIRY PRODUCTS	278	53	398	2091	0	2489
203	CANNED, CURED, AND FROZEN FOODS	508	129	4505	9808	1037	15351
204	GRAIN MILL PRODUCTS	221	59	297	253	111	663
205	BAKERY PRODUCTS	241	42	271	4	0	276
206	SUGAR	18	7	1031	7026	6680	14737
207	CONFECTIONERY AND RELATED PRODUCTS	119	28	81	2165	0	2247
208	BEVERAGES	332	96	2846	1638	0	4485
209	MISC. FOODS AND KINDRED PRODUCTS	429	108	1427	780	50	2258
210	TOBACCO MANUFACTURES	4					
211	CIGARETTES	1					
212	CIGARS	3					
220	TEXTILE MILL PRODUCTS	252	52	207	*	0	207
221	WEAVING MILLS, COTTON	6					
222	WEAVING MILLS, SYNTHETICS	5	1	*	0	0	*
223	WEAVING AND FINISHING MILLS, WOOL	11	1	3	0	0	3
224	NARROW FABRIC MILLS	13	3	4	*	0	4
225	KNITTING MILLS	71	8	23	0	0	23
226	TEXTILE FINISHING, EXCEPT WOOL	24	3	60	0	0	60
227	FLOOR COVERING MILLS	52	13	102	0	0	102
228	YARN AND THREAD MILLS	8	2	*	0	0	*
229	MISCELLANEOUS TEXTILE GOODS	62	21	14	0	0	14
230	APPAREL AND OTHER TEXTILE PRODUCTS	2183	250	93	0	0	93
231	MEN'S AND BOYS' SUITS AND COATS	28	8	7	0	0	7
232	MEN'S AND BOYS' FURNISHINGS	186	26	15	0	0	15
233	WOMEN'S AND MISSES' OUTERWEAR	1202	127	33	0	0	33
234	WOMEN'S AND CHILDREN'S UNDERGARMENTS	55	7	2	0	0	2
235	HATS, CAPS, AND MILLINERY	30	1	*	0	0	*
236	CHILDREN'S OUTERWEAR	46	7	2	0	0	2
237	FUR GOODS	28	2	*	0	0	*
238	MISCELLANEOUS APPAREL AND ACCESSORIES	71	11	2	0	0	2
239	MISC. FABRICATED TEXTILE PRODUCTS	537	61	30	0	0	30
240	LUMBER AND WOOD PRODUCTS	1608	277	1736	5807	*	7544
241	LOGGING CAMPS, + LOGGING CONTRACTORS	442	40	27	21	0	48
242	SAWMILLS AND PLANING MILLS	267	71	1634	4787	*	6421
243	MILLWORK, PLYWOOD + RELATED PRODUCTS	423	94	20	33	0	53

* indicates quantity between 0 and 1.
NOTE: Totals include quantities between 0 and 1

TABLE 2 (Continued)

REPORTED ANNUAL WATER INTAKE BY INDUSTRY GROUP IN 1970

(MILLION GALLONS)
1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	NUMBER OF PLANTS		FRESH WATER		BRACKISH WATER	TOTAL INTAKE WATER
		TOTAL	REPORTING	PURCHASED	SELF PRODUCED		
244	WOODEN CONTAINERS	134	14	35	0	0	35
249	MISCELLANEOUS WOOD PRODUCTS	342	58	19	964	0	983
250	FURNITURE AND FIXTURES	1258	207	368	*	0	368
251	HOUSEHOLD FURNITURE	825	131	282	*	0	282
252	OFFICE FURNITURE	57	10	21	0	0	21
253	PUBLIC BUILDING FURNITURE	26	6	51	0	0	51
254	PARTITIONS AND FIXTURES	253	41	8	*	0	8
259	MISCELLANEOUS FURNITURE AND FIXTURES	97	19	4	0	0	4
260	PAPER AND ALLIED PRODUCTS	470	156	18203	15779	20086	54069
261	PULP MILLS	3	1	8751	0	0	8751
262	PAPER MILLS, EXCEPT BUILDING PAPER	9	6	5866	7039	0	12905
263	PAPERBOARD MILLS	14	6	1637	7027	20086	28751
264	MISC. CONVERTED PAPER PRODUCTS	230	82	1477	839	0	2317
265	PAPERBOARD CONTAINERS AND BOXES	207	60	470	873	0	1344
266	BUILDING PAPER AND BOARD MILLS	7	1	*	0	0	*
270	PRINTING AND PUBLISHING	3735	455	386	8	0	394
271	NEWSPAPERS	501	72	118	1	0	120
272	PERIODICALS	258	19	8	0	0	8
273	BOOKS	149	18	13	0	0	13
274	MISCELLANEOUS PUBLISHING	259	29	19	0	0	19
275	COMMERCIAL PRINTING	2119	255	185	6	0	191
276	MANIFOLD BUSINESS FORMS	49	12	15	*	0	16
277	GREETING CARD PUBLISHING	24	2	*	0	0	*
278	BLANKBOOKS AND BOOKBINDING	147	21	16	0	0	16
279	PRINTING TRADE SERVICES	229	27	7	0	0	7
280	CHEMICALS AND ALLIED PRODUCTS	1157	383	6713	6995	20146	33854
281	INDUSTRIAL CHEMICALS	169	77	4511	4842	18687	28041
282	PLASTICS MATERIALS AND SYNTHETICS	86	41	486	4	15	506
283	DRUGS	140	36	314	0	0	314
284	SOAP, CLEANERS, AND TOILET GOODS	271	81	509	985	903	2398
285	PAINTS AND ALLIED PRODUCTS	204	66	248	0	0	248
286	GUM AND WOOD CHEMICALS	4	1	4	0	0	4
287	AGRICULTURAL CHEMICALS	98	34	374	832	540	1746
289	MISCELLANEOUS CHEMICAL PRODUCTS	185	47	262	330	0	593
290	PETROLEUM AND COAL PRODUCTS	230	54	23405	5842	70053	99302
291	PETROLEUM REFINING	135	31	23170	5149	70053	98373
295	PAVING AND ROOFING MATERIALS	56	12	162	691	0	854
299	MISC. PETROLEUM AND COAL PRODUCTS	39	11	73	1	0	74
300	RUBBER AND PLASTICS PRODUCTS, NEC	961	198	309	716	0	1025
301	TIRES AND INNER TUBES	26	9	83	715	0	799
302	RUBBER FOOTWEAR	2					
303	RECLAIMED RUBBER	3					
306	FABRICATED RUBBER PRODUCTS, NEC	145	20	19	0	0	19
307	MISCELLANEOUS PLASTICS PRODUCTS	785	169	206	*	0	207

* indicates quantity between 0 and 1.
NOTE: Totals include quantities between 0 and 1

TABLE 2 (Continued)

REPORTED ANNUAL WATER INTAKE BY INDUSTRY GROUP IN 1970

(MILLION GALLONS)
1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	NUMBER OF PLANTS		FRESH WATER		BRACKISH WATER	TOTAL INTAKE WATER
		TOTAL	REPORTING	PURCHASED	SELF PRODUCED		
310	LEATHER AND LEATHER PRODUCTS	205	38	366.501	191	0	558
311	LEATHER TANNING AND FINISHING	18	4	354.569	191	0	546
312	INDUSTRIAL LEATHER BELTING	7	1	.108	0	0	*
313	FOOTWEAR CUT STOCK	9	2	.674	0	0	*
314	FOOTWEAR, EXCEPT RUBBER	50	8	4.828	0	0	4
315	LEATHER GLOVES AND MITTENS	9	1	.205	0	0	*
316	LUGGAGE	27	7	2.181	0	0	2
317	HANDBAGS AND PERSONAL LEATHER GOODS	50	7	3.173	0	0	3
319	LEATHER GOODS, NEC	35	8	.764	0	0	*
320	STONE, CLAY, AND GLASS PRODUCTS	1146	255	1754.713	2209	75	4039
321	FLAT GLASS	7	2	110.645	0	0	110
322	GLASS AND GLASSWARE, PRESSED OR BLOWN	61	15	472.579	180	75	727
323	PRODUCTS OF PURCHASED GLASS	99	16	2.523	0	0	2
324	CEMENT, HYDRAULIC	22	5	294.018	685	0	979
325	STRUCTURAL CLAY PRODUCTS	61	14	90.111	6	0	96
326	POTTERY AND RELATED PRODUCTS	143	20	63.387	*	0	63
327	CONCRETE, GYPSUM, AND PLASTER PRODUCTS	526	128	491.186	859	*	1350
328	CUT STONE AND STONE PRODUCTS	38	3	2.086	2	0	4
329	MISC. NONMETALLIC MINERAL PRODUCTS	189	52	228.178	475	0	703
330	PRIMARY METAL INDUSTRIES	711	193	5597.831	1380	35	7013
331	BLAST FURNACE AND BASIC STEEL PRODUCTS	103	31	3344.453	1283	0	4627
332	IRON AND STEEL FOUNDRIES	106	33	152.944	33	0	186
333	PRIMARY NONFERROUS METALS	10	2	5.120	0	35	40
334	SECONDARY NONFERROUS METALS	35	8	69.643	0	0	69
335	NONFERROUS ROLLING AND DRAWING	97	28	1813.004	64	0	1877
336	NONFERROUS FOUNDRIES	233	57	29.250	0	0	29
339	MISCELLANEOUS PRIMARY METAL PRODUCTS	127	34	183.409	0	0	183
340	FABRICATED METAL PRODUCTS	3125	645	2460.926	108	2	2571
341	METAL CANS	46	20	461.405	0	0	461
342	CUTLERY, HAND TOOLS, AND HARDWARE	279	61	100.018	0	0	100
343	PLUMBING AND HEATING, EXCEPT ELECTRIC	106	19	19.161	*	0	19
344	FABRICATED STRUCTURAL METAL PRODUCTS	1129	221	401.288	1	0	402
345	SCREW MACHINE PRODUCTS, BOLTS, ETC.	216	42	157.821	*	0	158
346	METAL STAMPINGS	230	45	60.768	*	0	60
347	METAL SERVICES, NEC	701	131	1037.584	3	2	1042
348	MISC. FABRICATED WIRE PRODUCTS	177	49	51.856	103	0	155
349	MISC. FABRICATED METAL PRODUCTS	241	57	171.024	0	0	171
350	MACHINERY, EXCEPT ELECTRICAL	4518	750	1002.895	601	0	1603
351	ENGINES AND TURBINES	30	5	51.852	22	0	73
352	FARM MACHINERY	148	34	16.729	*	0	17
353	CONSTRUCTION AND RELATED MACHINERY	267	53	32.166	1	0	33
354	METAL WORKING MACHINERY	792	122	229.240	*	0	229
355	SPECIAL INDUSTY MACHINERY	261	70	83.470	30	0	113
356	GENERAL INDUSTRIAL MACHINERY	377	68	60.681	200	0	261
357	OFFICE AND COMPUTING MACHINES	213	45	365.557	291	0	656

* indicates quantity between 0 and 1.
NOTE: Totals include quantities between 0 and 1.

TABLE 2 (Continued)

REPORTED ANNUAL WATER INTAKE BY INDUSTRY GROUP IN 1970

(MILLION GALLONS)
1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	NUMBER OF PLANTS		FRESH WATER		BRACKISH WATER	TOTAL INTAKE WATER
		TOTAL	REPORTING	PURCHASED	SELF PRODUCED		
358	SERVICE INDUSTRY MACHINES	150	33	101	54	0	155
359	MISC. MACHINERY, EXCEPT ELECTRICAL	2280	320	61	*	0	62
360	ELECTRICAL EQUIPMENT AND SUPPLIES	2043	361	1326	150	0	1477
361	ELECTRIC TEST + DISTRIBUTING EQUIPMENT	200	43	38	0	0	38
362	ELECTRICAL INDUSTRIAL APPARATUS	150	34	46	144	0	190
363	HOUSEHOLD APPLIANCES	63	5	197	0	0	197
364	ELECTRIC LIGHTING AND WIRING EQUIPMENT	298	46	64	0	0	64
365	RADIO AND TV RECEIVING EQUIPMENT	199	27	107	0	0	107
366	COMMUNICATION EQUIPMENT	313	64	302	0	0	302
367	ELECTRONIC COMPONENTS AND ACCESSORIES	715	122	505	6	0	511
369	MISC. ELECTRICAL EQUIPMENT + SUPPLIES	105	20	63	0	0	63
370	TRANSPORTATION EQUIPMENT	1633	283	4419	13	718	5151
371	MOTOR VEHICLES AND EQUIPMENT	384	76	381	0	0	381
372	AIRCRAFT THE PARTS	644	132	2830	10	0	2841
373	SHIP AND BOAT BUILDING AND REPAIRING	285	30	1178	3	718	1900
374	RAILROAD EQUIPMENT	3	1		0	0	*
375	MOTORCYCLES, BICYCLES, AND PARTS	44	6	11	0	0	11
379	MISCELLANEOUS TRANSPORTATION EQUIPMENT	273	38	16	0	0	16
380	INSTRUMENTS AND RELATED PRODUCTS	769	130	529	0	0	529
381	ENGINEERING + SCIENTIFIC INSTRUMENTS	123	19	105	0	0	105
382	MECHANICAL MEASURING + CONTROL DEVICES	154	24	270	0	0	270
383	OPTICAL INSTRUMENTS AND LENSES	73	13	5	0	0	5
384	MEDICAL INSTRUMENTS AND SUPPLIES	221	40	73	0	0	73
385	OPHTHALMIC GOODS	69	9	2	0	0	2
386	PHOTOGRAPHIC EQUIPMENT AND SUPPLIES	120	24	72	0	0	72
387	WATCHES, CLOCKS, AND WATCHCASES	9	1	*	0	0	*
390	MISCELLANEOUS MANUFACTURING INDUSTRIES	1263	194	267	*	0	267
391	JEWELRY, SILVERWARE, AND PLATED WARE	158	24	2	0	0	2
393	MUSICAL INSTRUMENTS AND PARTS	31	3	17	0	0	17
394	TOYS AND SPORTING GOODS	313	40	199	*	0	199
395	PENS, PENCILS, OFFICE AND ART SUPPLIES	108	27	22	*	0	22
396	COSTUME JEWELRY AND NOTIONS	112	14	1	0	0	1
399	MISCELLANEOLS MANUFACTURES	541	86	24		0	24
	MILLION GALLONS TOTAL	29786	5491	82015	64511	118996	265523
	ACRE FEET TOTAL			251697	197977	365187	814862

* indicates quantity between 0 and 1.
NOTE: Totals include quantities between 0 and 1

TABLE 3

REPORTED ANNUAL WATER INTAKE BY COUNTY IN 1970

(MILLION GALLONS)
1 MILLION GALLONS = 3785.4 CUBIC METRES

COUNTY CODE	COUNTY	NUMBER OF PLANTS		FRESH WATER		BRACKISH WATER	TOTAL INTAKE WATER
		TOTAL	REPORTING	PURCHASED	SELF PRODUCED		
1	ALPINE	1					
2	AMADOR	17	6	352	49	0	401
3	BUTTE	113	23	340	447	0	788
4	CALAVERAS	22	7	263	*	0	264
5	COLUSA	16	2	*	0	0	*
6	CONTRA COSTA	384	116	20855	14452	59681	94989
7	DEL NORTE	40	8	4	144	0	149
8	EL DORADO	55	10	86	304	0	390
9	FRESNO	472	91	573	2810	0	3383
10	GLENN	28	2	*	0	0	*
11	HUMBOLDT	223	34	8800	915	0	9715
12	IMPERIAL	63	6	7	180	0	187
13	INYO	13					
14	KERN	235	52	118	2071	0	2189
15	KINGS	46	18	46	462	0	509
16	LAKE	24	3	*	*	0	*
17	LASSEN	19	3	997	*	0	997
18	MADERA	46	6	*	38	0	39
19	MARIN	165	34	34	1	*	36
20	MARIPOSA	8	2	*	0	0	*
21	MENDOCINO	128	29	116	1716	0	1832
22	MERCED	74	16	612	325	0	938
23	MODOC	12	3	*	*	0	*
24	MONO	4	1	*	0	0	*
25	MONTEREY	150	30	81	2895	9937	12914
26	NAPA	71	19	69	13	0	82
27	NEVADA	31	3	30	*	0	30
28	ORANGE	2045	223	2301	613	0	2914
29	PLACER	61	4	15	7	0	22
30	PLUMAS	32	2	*	0	0	*
31	RIVERSIDE	393	40	574	249	0	824
32	SACRAMENTO	373	42	286	3828	0	4114
33	SAN BENITO	21	6	13	462	*	476
34	SAN BERNARDINO	609	109	2585	2740	2220	7546
35	SAN JOAQUIN	291	57	394	2851	16944	20189
36	SAN LUIS OBISPO	59	8	*	488	0	488
37	SAN MATEO	742	126	1199	24	1650	2874
38	SANTA BARBARA	238	37	42	1089	0	1131
39	SANTA CLARA	1339	319	2517	3751	0	6268
40	SANTA CRUZ	148	37	311	175	*	487
41	SHASTA	107	15	3984	1134	0	5118
42	SIERRA	6	1	0	*	0	*
43	SISKIYOU	79	10	9	624	0	633
44	SOLANO	82	17	29	833	0	862
45	SONOMA	294	59	9	51	0	60
46	STANISLAUS	217	56	666	4790	0	5456
47	SUTTER	40	9	25	173	0	198

* indicates quantity between 0 and 1.
NOTE: Totals include quantities between 0 and 1.

TABLE 3 (Continued)

REPORTED ANNUAL WATER INTAKE BY COUNTY IN 1970

(MILLION GALLONS)
1 MILLION GALLONS = 3785.4 CUBIC METRES

COUNTY CODE	COUNTY	NUMBER OF PLANTS		FRESH WATER		BRACKISH WATER	TOTAL INTAKE WATER
		TOTAL	REPORTING	PURCHASED	SELF PRODUCED		
49	TEHAMA	36	7	10	972	0	983
49	TRINITY	21	2	1	52	0	53
50	TULARE	174	39	252	1588	0	1840
51	TUOLUMNE	27	7	61	1	0	62
52	VENTURA	243	50	919	260	35	1215
53	YOLO	81	24	44	1325	0	1370
54	YUBA	34	8	4	1	0	5
55	MULTI-COUNTY	5					
59	UNALLOCATED BY COUNTY	1					
60	LOS ANGELES	15562	2711	26010	7748	27230	60988
70	ALAMEDA	1541	489	4759	1738	583	7081
80	SAN FRANCISCO	1426	279	835		46	882
90	SAN DIEGO	999	174	756	100	667	1525
	MILLION GALLONS TOTAL	29786	5491	82015	64511	118996	265523
	ACRE FEET TOTAL			251697	197977	365187	814862

* indicates quantity between 0 and 1.
NOTE: Totals include quantities between 0 and 1.

TABLE 4

REPORTED ANNUAL WATER INTAKE BY TYPE OF USE AND INDUSTRY GROUP IN 1970

(MILLION GALLONS)

1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	NUMBER OF PLANTS		WATER INTAKE						
		TOTAL	REPORTING	COOLING	PROCESSING	BOILER FEED	AIR COND.	SANITARY	OTHER	TOTAL
190	ORDNANCE AND ACCESSORIES	54	9	45	154	16	183	257	47	706
191	GUNS, HOWITZERS AND MORTARS	1								
192	AMMUNITION, EXCEPT FOR SMALL ARMS	29	4	0	95	15	182	232	44	571
193	TANKS AND TANK COMPONENTS	1	3	45	58	1	*	24	3	133
194	SIGHTING AND FIRE CONTROL EQUIPMENT	1								
195	SMALL ARMS	11	1	0	0	0	*	*	0	*
196	SMALL ARMS AMMUNITION	6	1	0	0	0	0	*	0	*
199	ORDNANCE AND ACCESSORIES, NEC	5								
200	FOOD AND KINDRED PRODUCTS	2461	502	17803	18347	2825	646	704	3013	43340
201	MEAT PRODUCTS	315	63	601	1046	87	45	87	67	1936
202	DAIRY PRODUCTS	278	40	1134	595	89	1	15	470	2306
203	CANNED, CURED, AND FROZEN FOODS	508	115	3108	8775	1087	144	209	1643	14969
204	GRAIN MILL PRODUCTS	221	51	222	179	76	1	14	140	635
205	BAKERY PRODUCTS	241	31	47	50	38	*	48	22	207
206	SUGAR	18	7	9766	3730	849	0	98	72	14517
207	CONFECTIONERY AND RELATED PRODUCTS	119	21	1744	39	14	375	22	38	2235
208	BEVERAGES	332	87	736	2682	305	41	138	499	4403
209	MISC. FOODS AND KINDRED PRODUCTS	429	87	442	1248	275	35	69	58	2128
210	TOBACCO MANUFACTURES	4								
211	CIGARETTES	1								
212	CIGARS	3								
220	TEXTILE MILL PRODUCTS	252	52	13	121	38	*	26	7	207
221	WEAVING MILLS, COTTON	6								
222	WEAVING MILLS, SYNTHETICS	5	1	0	0	0	0	*	0	*
223	WEAVING AND FINISHING MILLS, WOOL	11	1	0	2	*	0	*	0	3
224	NARROW FABRIC MILLS	13	3		4	0	0	*	0	4
225	KNITTING MILLS	71	8	0	6	2	*	6	7	23
226	TEXTILE FINISHING, EXCEPT WOOL	24	3	10	25	23	0	*	0	60
227	FLOOR COVERING MILLS	52	13	2	81	12	*	6	0	102
228	YARN AND THREAD MILLS	8	2	0	0	0	0	*	0	*
229	MISCELLANEOUS TEXTILE GOODS	62	21	*	1	*	*	12	0	14
230	APPAREL AND OTHER TEXTILE PRODUCTS	2183	250	*	0	14	1	77	0	93
231	MEN'S AND BOYS' SUITS AND COATS	28	8	0	0	*	0	7	0	7
232	MEN'S AND BOYS' FURNISHINGS	186	26	0	0	*	*	14	0	15
233	WOMEN'S AND MISSES' OUTERWEAR	1202	127	*	0	*	*	31	0	33
234	WOMEN'S AND CHILDREN'S UNDERGARMENTS	55	7	0	0	0	0	2	0	2
235	HATS, CAPS, AND MILLINERY	30	1	0	0	0	0	*	0	*
236	CHILDREN'S OUTERWEAR	46	7	0	0	*	0	2	0	2
237	FUR GOODS	28	2	0	0	0	0	*	0	*
238	MISCELLANEOUS APPAREL AND ACCESSORIES	71	11	0	0	0	0	2	0	2
239	MISC. FABRICATED TEXTILE PRODUCTS	537	61	0	0	13	*	15	0	30
240	LUMBER AND WOOD PRODUCTS	1608	270	1708	1635	638	1072	105	421	5581
241	LOGGING CAMPS, + LOGGING CONTRACTORS	442	40	*	24	*	0	4	4	34
242	SAWMILLS AND PLANING MILLS	267	64	1079	1421	460	1071	55	384	4473
243	MILLWORK, PLYWOOD + RELATED PRODUCTS	423	94	7	2	16		26	0	53

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 4 (Continued)

REPORTED ANNUAL WATER INTAKE BY TYPE OF USE AND INDUSTRY GROUP IN 1970

(MILLION GALLONS)

1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	NUMBER OF PLANTS		WATER INTAKE						
		TOTAL	REPORTING	COOLING	PROCESSING	BOILER FEED	AIR COND.	SANITARY	OTHER	TOTAL
244	WOODEN CONTAINERS	134	14	0	0	0	0	3	32	35
249	MISCELLANEOUS WOOD PRODUCTS	342	58	622	186	160	*	14	0	983
250	FURNITURE AND FIXTURES	1258	207	*	205	1	*	83	*	291
251	HOUSEHOLD FURNITURE	825	131	*	198	1	*	47	*	246
252	OFFICE FURNITURE	57	10	*	0	0	0	20	0	21
253	PUBLIC BUILDING FURNITURE	26	6	0	6	0	*	3	0	10
254	PARTITIONS AND FIXTURES	253	41	*	*	0	0	7	0	8
259	MISCELLANEOUS FURNITURE AND FIXTURES	97	19	0	0	*	0	4		4
260	PAPER AND ALLIED PRODUCTS	470	138	26202	21164	865	693	168	774	49868
261	PULP MILLS	3	1	900	6900	200	100	1	650	8751
262	PAPER MILLS, EXCEPT BUILDING PAPER	9	6	4554	3637	100	559	16	2	8870
263	PAPERBOARD MILLS	14	6	20293	7937	306	0	23	86	28647
264	MISC. CONVERTED PAPER PRODUCTS	230	70	387	1805	13	11	63	4	2285
265	PAPERBOARD CONTAINERS AND BOXES	207	54	67	883	245	22	63	31	1314
266	BUILDING PAPER AND BOARD MILLS	7	1	0	0	0	0	*	0	*
270	PRINTING AND PUBLISHING	3735	455	41	8	7	11	283	10	363
271	NEWSPAPERS	501	72	17	2	0	1	98	0	120
272	PERIODICALS	258	19	0	0	0	0	8	0	8
273	BOOKS	149	18	*	0	0	0	2	10	13
274	MISCELLANEOUS PUBLISHING	259	29	4	0	7	3	4	0	19
275	COMMERCIAL PRINTING	2119	255	11	4	*	4	139	0	160
276	MANIFOLD BUSINESS FORMS	49	12	7	1	0	*	7	0	16
277	GREETING CARD PUBLISHING	24	2	0	0	0	0	*	0	*
278	BLANKBOOKS AND BOOKBINDING	147	21	0	0	0	*	15	0	16
279	PRINTING TRADE SERVICES	229	27	*	*	0	*	6	0	7
280	CHEMICALS AND ALLIED PRODUCTS	1157	334	11684	19035	1397	205	248	962	33533
281	INDUSTRIAL CHEMICALS	169	72	8665	17337	984	179	77	724	27968
282	PLASTICS MATERIALS AND SYNTHETICS	86	36	142	196	41	1	39	72	493
283	DRUGS	140	33	83	100	53	18	29	28	313
284	SOAP, CLEANERS, AND TOILET GOODS	271	64	1517	496	175	2	31	83	2308
285	PAINTS AND ALLIED PRODUCTS	204	56	59	47	16	2	31	12	170
286	GUM AND WOOD CHEMICALS	4	1	0	4	0	0	*	0	4
287	AGRICULTURAL CHEMICALS	98	32	1141	486	48	*	19	36	1731
289	MISCELLANEOUS CHEMICAL PRODUCTS	185	40	74	366	76	*	19	4	543
290	PETROLEUM AND COAL PRODUCTS	230	52	82553	6618	8052	636	199	1109	99169
291	PETROLEUM REFINING	135	31	82525	5909	7958	636	175	1036	98241
295	PAVING AND ROOFING MATERIALS	56	11	25	653	86	*	18	70	854
299	MISC. PETROLEUM AND COAL PRODUCTS	39	10	2	55	7	0	5	2	74
300	RUBBER AND PLASTICS PRODUCTS, NEC	961	173	470	235	203	1	88	5	1004
301	TIRES AND INNER TUBES	26	8	366	204	182	0	45	0	798
302	RUBBER FOOTWEAR	2								
303	RECLAIMED RUBBER	3								
306	FABRICATED RUBBER PRODUCTS, NEC	145	17	5	1	3	*	6	*	17
307	MISCELLANEOUS PLASTICS PRODUCTS	785	148	98	28	17	1	36	5	187

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 4 (Continued)

REPORTED ANNUAL WATER INTAKE BY TYPE OF USE AND INDUSTRY GROUP IN 1970

(MILLION GALLONS)

1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	NUMBER OF PLANTS		WATER INTAKE						
		TOTAL	REPORTING	COOLING	PROCESSING	BOILER FEED	AIR COND.	SANITARY	OTHER	TOTAL
310	LEATHER AND LEATHER PRODUCTS	205	38	41	468	7	0	17	0	534
311	LEATHER TANNING AND FINISHING	18	4	41	465	7	0	8	0	522
312	INDUSTRIAL LEATHER BELTING	7	1	0	0	0	0	*	0	*
313	FOOTWEAR CUT STOCK	9	2	0	0	0	0	*	0	*
314	FOOTWEAR, EXCEPT RUBBER	50	8	0	0	0	0	4	0	4
315	LEATHER GLOVES AND MITTENS	9	1	0	0	0	0	*	0	*
316	LUGGAGE	27	7	0	0	0	0	2	0	2
317	HANDBAGS AND PERSONAL LEATHER GOODS	50	7	0	2	0	0	*	0	3
319	LEATHER GOODS, NEC	35	8	0	0	0	0	*	0	*
320	STONE, CLAY, AND GLASS PRODUCTS	1146	253	843	1878	114	39	222	479	3577
321	FLAT GLASS	7	2	38	5	0	1	20	45	110
322	GLASS AND GLASSWARE, PRESSED OR BLOWN	61	13	285	95	*	*	73	0	454
323	PRODUCTS OF PURCHASED GLASS	99	16	1	*	0	0	*	0	2
324	CEMENT, HYDRAULIC	22	5	364	290	0	16	19	256	946
325	STRUCTURAL CLAY PRODUCTS	61	14	3	74	0	*	11	7	96
326	POTTERY AND RELATED PRODUCTS	143	20	3	42	0	0	17	0	63
327	CONCRETE, GYPSUM, AND PLASTER PRODUCTS	526	128	51	987	53	10	50	48	1200
328	CUT STONE AND STONE PRODUCTS	38	3	0	0	0	0	2	0	2
329	MISC. NONMETALLIC MINERAL PRODUCTS	189	52	95	382	60	11	27	121	700
330	PRIMARY METAL INDUSTRIES	711	170	2586	2994	709	24	412	81	6809
331	BLAST FURNACE AND BASIC STEEL PRODUCTS	103	29	2043	1626	642	6	222	6	4547
332	IRON AND STEEL FOUNDRIES	106	28	76	47	*	1	25	32	182
333	PRIMARY NONFERROUS METALS	10	2	*	35	0	0	*	4	40
334	SECONDARY NONFERROUS METALS	35	8	33	33	*	0	2	0	69
335	NONFERROUS ROLLING AND DRAWING	97	26	398	1212	38	15	145	35	1845
336	NONFERROUS FOUNDRIES	233	49	11	3	*	*	8	*	24
339	MISCELLANEOUS PRIMARY METAL PRODUCTS	127	28	23	36	27	2	7	2	98
340	FABRICATED METAL PRODUCTS	3125	644	425	871	125	45	498	13	1978
341	METAL CANS	46	20	186	76	104	0	90	4	461
342	CUTLERY, HAND TOOLS, AND HARDWARE	279	61	11	45	5	*	37	0	100
343	PLUMBING AND HEATING, EXCEPT ELECTRIC	106	19	2	5	0	0	12	*	19
344	FABRICATED STRUCTURAL METAL PRODUCTS	1129	220	72	187	1	*	139	*	401
345	SCREW MACHINE PRODUCTS, BOLTS, ETC.	216	42	35	70	*	1	43	0	151
346	METAL STAMPINGS	230	45	3	10	1	*	43	*	60
347	METAL SERVICES, NEC	701	131	13	376	10	37	22	7	467
348	MISC. FABRICATED WIRE PRODUCTS	177	49	45	63	1	0	35	*	145
349	MISC. FABRICATED METAL PRODUCTS	241	57	55	35	1	5	73	*	171
350	MACHINERY, EXCEPT ELECTRICAL	4518	749	164	378	31	213	691	16	1495
351	ENGINES AND TURBINES	30	5	20	33	0	*	20	0	73
352	FARM MACHINERY	148	34	*	5	0	0	7	5	17
353	CONSTRUCTION AND RELATED MACHINERY	267	53	2	2	*	*	27	*	33
354	METAL WORKING MACHINERY	792	122	89	2	0	*	28	0	121
355	SPECIAL INDUSTY MACHINERY	261	70	25	20	2	19	37	7	113
356	GENERAL INDUSTRIAL MACHINERY	377	68		124	3	90	40	2	261
357	OFFICE AND COMPUTING MACHINES	213	45	15	98	21	100	419	0	656

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 4 (Continued)

REPORTED ANNUAL WATER INTAKE BY TYPE OF USE AND INDUSTRY GROUP IN 1970

(MILLION GALLONS)

1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	NUMBER OF PLANTS		WATER INTAKE						
		TOTAL	REPORTING	COOLING	PROCESSING	BOILER FEED	AIR COND.	SANITARY	OTHER	TOTAL
358	SERVICE INDUSTRY MACHINES	150	33	2	84	3	*	63	*	155
359	MISC. MACHINERY, EXCEPT ELECTRICAL	2280	319	7	5	*	1	47	*	62
360	ELECTRICAL EQUIPMENT AND SUPPLIES	2043	361	265	167	21	146	623	12	1237
361	ELECTRIC TEST + DISTRIBUTING EQUIPMENT	200	43	1	*	*	1	36	0	38
362	ELECTRICAL INDUSTRIAL APPARATUS	150	34	147	*	6	2	33	0	190
363	HOUSEHOLD APPLIANCES	63	5	0	9	0	0	1	0	11
364	ELECTRIC LIGHTING AND WIRING EQUIPMENT	298	46	3	28	3	*	28	*	64
365	RADIO AND TV RECEIVING EQUIPMENT	199	27	40	16	8	3	35	0	104
366	COMMUNICATION EQUIPMENT	313	64	48	41	2	50	150	7	301
367	ELECTRONIC COMPONENTS AND ACCESSORIES	715	122	19	55	*	87	324	3	490
369	MISC. ELECTRICAL EQUIPMENT + SUPPLIES	105	20	5	14	0		12	2	35
370	TRANSPORTATION EQUIPMENT	1633	280	1181	1521	203	315	1283	522	5028
371	MOTOR VEHICLES AND EQUIPMENT	384	76	53	206	60	11	49	*	381
372	AIRCRAFT THE PARTS	644	129	724	538	59	304	1100	66	2793
373	SHIP AND BOAT BUILDING AND REPAIRING	285	30	403	773	83	0	108	456	1825
374	RAILROAD EQUIPMENT	3	1	0	0	0	0	*	0	*
375	MOTORCYCLES, BICYCLES, AND PARTS	44	6	0	1	*	0	9	0	11
379	MISCELLANEOUS TRANSPORTATION EQUIPMENT	273	38	0	*	0	*	15	*	16
380	INSTRUMENTS AND RELATED PRODUCTS	769	130	87	111	17	44	265	3	529
381	ENGINEERING + SCIENTIFIC INSTRUMENTS	123	19	10	5	1	4	81	1	105
382	MECHANICAL MEASURING + CONTROL DEVICES	154	24	71	81	2	4	111	*	270
383	OPTICAL INSTRUMENTS AND LENSES	73	13	0	0	0	3	1	0	5
384	MEDICAL INSTRUMENTS AND SUPPLIES	221	40	5	16	13	3	35	0	73
385	OPHTHALMIC GOODS	69	9	0	0	0	0	2	0	2
386	PHOTOGRAPHIC EQUIPMENT AND SUPPLIES	120	24	*	7	0	28	33	2	72
387	WATCHES, CLOCKS, AND WATCHCASES	9	1	0	0	0	0	*	0	*
390	MISCELLANEOUS MANUFACTURING INDUSTRIES	1263	194	140	12	54	*	49	3	259
391	JEWELRY, SILVERWARE, AND PLATED WARE	158	24	0	*	0	*	2	0	2
393	MUSICAL INSTRUMENTS AND PARTS	31	3	8	0	0	0	5	3	17
394	TOYS AND SPORTING GOODS	313	40	127	2	53	*	12	0	196
395	PENS, PENCILS, OFFICE AND ART SUPPLIES	108	27	0	8	*	*	8	0	17
396	COSTUME JEWELRY AND NOTIONS	112	14	0	0	0	0	1	0	1
399	MISCELLANEOUS MANUFACTURES	541	86	4	1	*	*	18	*	24
	TOTAL	29786	5261	146261	75930	15345	4281	6307	7486	255612

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 5

REPORTED ANNUAL FRESH WATER INTAKE, RECIRCULATION, AND DISCHARGE IN 1970

(MILLION GALLONS)

1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	TOTAL NO. OF PLANTS	RECIRCULATION					DISCHARGE		
			PLANTS REPORTING	INTAKE	RECYCLED 1/	GROSS USE	RECYCLE RATE	PLANTS REPORTING	INTAKE	WATER DISCHARGE
190	ORDNANCE AND ACCESSORIES	54	9	706	1576	2282	3	6	690	411
191	GUNS, HOWITZERS AND MORTARS	1								
192	AMMUNITION, EXCEPT FOR SMALL ARMS	29	4	571	1565	2136	3	2	557	393
193	TANKS AND TANK COMPONENTS	1	3	133	11	145	1	3	133	18
194	SIGHTING AND FIRE CONTROL EQUIPMENT	1								
195	SMALL ARMS	11	1	*	0	*	1			
196	SMALL ARMS AMMUNITION	6	1	*	0	*	1	1	*	*
199	ORDNANCE AND ACCESSORIES, NEC	5								
200	FOOD AND KINDRED PRODUCTS	2461	548	35656	57100	92757	2	411	27492	21109
201	MEAT PRODUCTS	315	75	2106	882	2989	1	59	1739	1610
202	DAIRY PRODUCTS	278	45	2282	1496	3778	1	38	2380	1126
203	CANNED, CURED, AND FROZEN FOODS	508	121	13692	16315	30007	2	104	12745	9725
204	GRAIN MILL PRODUCTS	221	57	468	33	502	1	37	381	304
205	BAKERY PRODUCTS	241	38	269	29	298	1	13	159	74
206	SUGAR	18	7	8057	27038	35096	4	2	1507	1340
207	CONFECTIONERY AND RELATED PRODUCTS	119	23	2238	227	2466	1	18	2220	2097
208	BEVERAGES	332	90	4412	4736	9149	2	67	4364	3177
209	MISC. FOODS AND KINDRED PRODUCTS	429	92	2129	6338	8468	3	73	1993	1652
210	TOBACCO MANUFACTURES	4								
211	CIGARETTES	1								
212	CIGARS	3								
220	TEXTILE MILL PRODUCTS	252	52	207	46	253	1	32	178	155
221	WEAVING MILLS, COTTON	6								
222	WEAVING MILLS, SYNTHETICS	5	1	*	0	*	1			
223	WEAVING AND FINISHING MILLS, WOOL	11	1	3	0	3	1	1	3	2
224	NARROW FABRIC MILLS	13	3	4	0	4	1	2	4	4
225	KNITTING MILLS	71	8	23	*	23	1	5	20	11
226	TEXTILE FINISHING, EXCEPT WOOL	24	3	60	0	60	1	1	43	42
227	FLOOR COVERING MILLS	52	13	102	0	102	1	9	95	91
228	YARN AND THREAD MILLS	9	2	*	0	*	1	2	*	*
229	MISCELLANEOUS TEXTILE GOODS	62	21	14	45	60	4	12	12	3
230	APPAREL AND OTHER TEXTILE PRODUCTS	2183	250	78 2/	* 2/	78 2/	1 2/	193	57	53
231	MEN'S AND BOYS' SUITS AND COATS	28	8	7	*	7	1	7	7	5
232	MEN'S AND BOYS' FURNISHINGS	186	26	←	INC. 3/	→		20	12	11
233	WOMEN'S AND MISSES' OUTERWEAR	1202	127	33	0	33	1	98	23	22
234	WOMEN'S AND CHILDREN'S UNDERGARMENTS	55	7	2	0	2	1	5	2	2
235	HATS, CAPS, AND MILLINERY	30	1	*	0	*	1	1	*	*
236	CHILDREN'S OUTERWEAR	46	7	2	0	2	1	3	*	*
237	FUR GOODS	28	2	*	0	*	1	2	*	*

1/ Recycled – The additional amount of water required without recirculation.

2/ Totals do not include inconclusive data

3/ INC – inconclusive data.

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 5 (Continued)

REPORTED ANNUAL FRESH WATER INTAKE, RECIRCULATION, AND DISCHARGE IN 1970

(MILLION GALLONS)

1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	TOTAL NO. OF PLANTS	RECIRCULATION					DISCHARGE		
			PLANTS REPORTING	INTAKE	RECYCLED 1/	GROSS USE	RECYCLE RATE	PLANTS REPORTING	INTAKE	WATER DISCHARGE
238	MISCELLANEOUS APPAREL AND ACCESSORIES	71	11	2	0	2	1	7	*	*
239	MISC. FABRICATED TEXTILE PRODUCTS	537	61	30	0	30	1	50	10	9
240	LUMBER AND WOOD PRODUCTS	1608	273	6501	8543	15045	2	195	5400	3214
241	LOGGING CAMPS, + LOGGING CONTRACTORS	442	40	48	*	48	1	26	4	4
242	SAWMILLS AND PLANING MILLS	267	68	5386	8505	13892	2	50	4590	2489
243	MILLWORK, PLYWOOD + RELATED PRODUCTS	423	94	53	30	83	1	69	38	25
244	WOODEN CONTAINERS	134	14	35	0	35	1	11	35	34
249	MISCELLANEOUS WOOD PRODUCTS	342	57	976	8	984	1	39	732	659
250	FURNITURE AND FIXTURES	1258	206	365	121	486	1	141	39	36 3/
251	HOUSEHOLD FURNITURE	825	131	282	120	403	1	88	23	22
252	OFFICE FURNITURE	57	9	17	0	17	1	5	6	6
253	PUBLIC BUILDING FURNITURE	26	6	51	0	51	1	5	INC 3/	→
254	PARTITIONS AND FIXTURES	253	41	8	*	8	1	29	3	3
259	MISCELLANEOUS FURNITURE AND FIXTURES	97	19	4	*	5	1	14	4	4
260	PAPER AND ALLIED PRODUCTS	470	151	33970	117408	151378	4	125	26676	24529
261	PULP MILLS	3	1	8751	59956	68707	7	1	8751	8575
262	PAPER MILLS, EXCEPT BUILDING PAPER	9	6	12905	13110	26015	2	5	5709	5173
263	PAPERBOARD MILLS	14	6	8665	13612	22277	2	5	8623	7609
264	MISC. CONVERTED PAPER PRODUCTS	230	78	2305	7005	9311	4	64	2275	2180
265	PAPERBOARD CONTAINERS AND BOXES	207	59	1343	23723	25066	18	49	1316	991
266	BUILDING PAPER AND BOARD MILLS	7	1	*	0	*	1	1	*	
270	PRINTING AND PUBLISHING	3735	455	394	58	453	1	334	167	155
271	NEWSPAPERS	501	72	120	7	127	1	49	48	42
272	PERIODICALS	258	19	8	*	9	1	19	8	8
273	BOOKS	149	18	13	0	13	1	13	12	11
274	MISCELLANEOUS PUBLISHING	259	29	19	50	69	3	25	4	3
275	COMMERCIAL PRINTING	2119	255	191	*	191	1	184	68	66
276	MANIFOLD BUSINESS FORMS	49	12	16	*	16	1	10	16	13
277	GREETING CARD PUBLISHING	24	2	*	0	*	1	1	*	*
278	BLANKBOOKS AND BOOKBINDING	147	21	16	*	16	1	13	2	2
279	PRINTING TRADE SERVICES	229	27	7	0	7	1	20	5	5
280	CHEMICALS AND ALLIED PRODUCTS	1157	370	13641	63357	76998	5	273	13322	8877
281	INDUSTRIAL CHEMICALS	169	75	9304	55552	64856	6	59	9132	6068
282	PLASTICS MATERIALS AND SYNTHETICS	86	37	476	1245	1721	3	33	467	403
283	DRUGS	140	36	314	3284	3598	11	22	272	183
284	SOAP, CLEANERS, AND TOILET GOODS	271	79	1494	191	1686	1	58	1459	1286
285	PAINTS AND ALLIED PRODUCTS	204	62	245	499	745	3	44	232	214
286	GUM AND WOOD CHEMICALS	4	1	4	0	4	1	1	4	4
287	AGRICULTURAL CHEMICALS	98	33	1206	1820	3027	2	19	1169	306
289	MISCELLANEOUS CHEMICAL PRODUCTS	185	47	593	764	1358	2	37	582	408

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2/ Totals do not include inconclusive data

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* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 5 (Continued)

REPORTED ANNUAL FRESH WATER INTAKE, RECIRCULATION, AND DISCHARGE IN 1970

(MILLION GALLONS)

1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	TOTAL NO. OF PLANTS	RECIRCULATION					DISCHARGE		
			PLANTS REPORTING	INTAKE	RECYCLED 1/	GROSS USE	RECYCLE RATE	PLANTS REPORTING	INTAKE	WATER DISCHARGE
290	PETROLEUM AND COAL PRODUCTS	230	51	28873	378037	406910	14	43	28927	12207
291	PETROLEUM REFINING	135	30	27947	371821	399769	14	28	28047	11484
295	PAVING AND ROOFING MATERIALS	56	11	852	6184	7037	8	9	852	707
299	MISC. PETROLEUM AND COAL PRODUCTS	39	10	73	30	104	1	6	27	14
300	RUBBER AND PLASTICS PRODUCTS, NEC	961	175	812 2/	7200 2/	8013 2/	9 2/	136	907	796
301	TIRES AND INNER TUBES	26	8	798	7143	7942	9	5	740	703
302	RUBBER FOOTWEAR	2								
303	RECLAIMED RUBBER	3								
306	FABRICATED RUBBER PRODUCTS, NEC	145	15	13	57	71	5	8	6	2
307	MISCELLANEOUS PLASTICS PRODUCTS	785	152	←	INC 3/	→		123	160	90
310	LEATHER AND LEATHER PRODUCTS	205	38	558	0	558	1	34	370	354
311	LEATHER TANNING AND FINISHING	18	4	546	0	546	1	3	359	343
312	INDUSTRIAL LEATHER BELTING	7	1	*	0	*	1	1	*	*
313	FOOTWEAR CUT STOCK	9	2	*	0	*	1	2	*	*
314	FOOTWEAR, EXCEPT RUBBER	50	8	4	0	4	1	7	4	4
315	LEATHER GLOVES AND MITTENS	9	1	*	0	*	1	1	*	*
316	LUGGAGE	27	7	2	0	2	1	6	1	1
317	HANDBAGS AND PERSONAL LEATHER GOODS	50	7	3	0	3	1	6	3	3
319	LEATHER GOODS, NEC	35	8	*	0	*	1	8	*	*
320	STONE, CLAY, AND GLASS PRODUCTS	1146	253	3950	6873	10824	2	165	3240	1632
321	FLAT GLASS	7	2	110	2100	2210	19	1	109	43
322	GLASS AND GLASSWARE, PRESSED OR BLOWN	61	14	642	1836	2479	3	13	652	459
323	PRODUCTS OF PURCHASED GLASS	99	16	2	0	2	1	9	1	1
324	CEMENT, HYDRAULIC	22	5	979	1057	2036	2	3	620	225
325	STRUCTURAL CLAY PRODUCTS	61	14	96	3	100	1	9	93	46
326	POTTERY AND RELATED PRODUCTS	143	20	63	*	63	1	16	51	35
327	CONCRETE, GYPSUM, AND PLASTER PRODUCTS	526	128	1350	1305	2655	1	75	1033	433
328	CUT STONE AND STONE PRODUCTS	38	3	4	0	4	1	3	4	4
329	MISC. NONMETALLIC MINERAL PRODUCTS	189	51	700	570	1270	1	38	673	381
330	PRIMARY METAL INDUSTRIES	711	183	6963	150662	157626	22	139	6853	3912
331	BLAST FURNACE AND BASIC STEEL PRODUCTS	103	29	4623	141059	145683	31	26	4591	1916
332	IRON AND STEEL FOUNDRIES	106	28	177	379	556	3	17	144	120
333	PRIMARY NONFERROUS METALS	10	2	5	0	5	1	1	5	4
334	SECONDARY NONFERROUS METALS	35	8	69	70	139	2	8	69	65
335	NONFERROUS ROLLING AND DRAWING	97	28	1877	8900	10778	5	26	1875	1655
336	NONFERROUS FOUNDRIES	233	55	28	204	232	8	34	18	12
339	MISCELLANEOUS PRIMARY METAL PRODUCTS	127	33	181	47	229	1	27	149	137
340	FABRICATED METAL PRODUCTS	3125	644	2559	10614	13174	5	462	1932	1840
341	METAL CANS	46	20	461	8737	9198	19	17	447	431

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* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 5 (Continued)

REPORTED ANNUAL FRESH WATER INTAKE, RECIRCULATION, AND DISCHARGE IN 1970

(MILLION GALLONS)

1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	TOTAL NO. OF PLANTS	RECIRCULATION					DISCHARGE		
			PLANTS REPORTING	INTAKE	RECYCLED 1/	GROSS USE	RECYCLE RATE	PLANTS REPORTING	INTAKE	WATER DISCHARGE
342	CUTLERY, HAND TOOLS, AND HARDWARE	279	61	100	19	119	1	49	97	88
343	PLUMBING AND HEATING, EXCEPT ELECTRIC	106	19	19	8	28	1	16	15	11
344	FABRICATED STRUCTURAL METAL PRODUCTS	1129	221	402	1340	1742	4	150	205	199
345	SCREW MACHINE PRODUCTS, BOLTS, ETC.	216	42	158	152	310	1	31	151	142
346	METAL STAMPINGS	230	44	50	72	123	2	29	52	50
347	METAL SERVICES, NEC	701	131	1040	80	1120	1	97	730	705
348	MISC. FABRICATED WIRE PRODUCTS	177	49	155	13	168	1	38	139	130
349	MISC. FABRICATED METAL PRODUCTS	241	57	171	189	360	2	35	96	79
350	MACHINERY, EXCEPT ELECTRICAL	4518	748	1447	1031	2479 2/	1 2/	565	1211	880
351	ENGINES AND TURBINES	30	5	73	0	73	1	4	73	1
352	FARM MACHINERY	148	34	17	30	47	2	26	16	15
353	CONSTRUCTION AND RELATED MACHINERY	267	53	33	32	66	1	40	23	16
354	METAL WORKING MACHINERY	792	121	228	570	798	3	94	213	200
355	SPECIAL INDUSTY MACHINERY	261	70	113	158	271	2	54	95	88
356	GENERAL INDUSTRIAL MACHINERY	377	68	261	1	262	1	48	48	46
357	OFFICE AND COMPUTING MACHINES	213	45	656	233	890	1	31	537	334
358	SERVICE INDUSTRY MACHINES	150	32	←	INC 3/	→		28	155	132
359	MISC. MACHINERY, EXCEPT ELECTRICAL	2280	320	62	5	67	1	242	48	42
360	ELECTRICAL EQUIPMENT AND SUPPLIES	2043	358	1442	4025	5467	3	268	1212	1087
361	ELECTRIC TEST + DISTRIBUTING EQUIPMENT	200	43	38	5	44	1	35	32	25
362	ELECTRICAL INDUSTRIAL APPARATUS	150	34	190	16	207	1	27	162	171
363	HOUSEHOLD APPLIANCES	63	5	197	352	549	2	3	197	187
364	ELECTRIC LIGHTING AND WIRING EQUIPMENT	298	45	42	76	119	2	33	62	56
365	RADIO AND TV RECEIVING EQUIPMENT	199	27	107	1	109	1	17	23	20
366	COMMUNICATION EQUIPMENT	313	64	302	157	459	1	47	249	185
367	ELECTRONIC COMPONENTS AND ACCESSORIES	715	120	499	3412	3912	7	92	454	415
369	MISC. ELECTRICAL EQUIPMENT + SUPPLIES	105	20	63	3	66	1	14	31	26
370	TRANSPORTATION EQUIPMENT	1633	283	4433	9848	14281	3	201	3585	3100
371	MOTOR VEHICLES AND EQUIPMENT	384	76	381	8	390	1	57	377	279
372	AIRCRAFT THE PARTS	644	132	2841	9826	12668	4	97	2723	2390
373	SHIP AND BOAT BUILDING AND REPAIRING	285	30	1181	11	1192	1	20	474	420
374	RAILROAD EQUIPMENT	3	1	*	0	*	1	1	*	*
375	MOTORCYCLES, BICYCLES, AND PARTS	44	6	11	1	12	1	3	2	2
379	MISCELLANEOUS TRANSPORTATION EQUIPMENT	273	38	16	0	16	1	23	8	7
380	INSTRUMENTS AND RELATED PRODUCTS	769	130	524 3/	449 3/	973 3/	1 2/	99	431	356
381	ENGINEERING + SCIENTIFIC INSTRUMENTS	123	19	105	4	109	1	14	40	25
382	MECHANICAL MEASURING + CONTROL DEVICES	154	24	270	231	501	1	15	253	239
383	OPTICAL INSTRUMENTS AND LENSES	73	13	←	INC 3/	→		10	*	*
384	MEDICAL INSTRUMENTS AND SUPPLIES	221	40	73	0	73	1	31	70	30
385	OPHTHALMIC GOODS	69	9	2	0	2	1	8	2	2

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NOTE: Totals include quantities between 0 and 1.

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TABLE 5 (Continued)

REPORTED ANNUAL FRESH WATER INTAKE, RECIRCULATION, AND DISCHARGE IN 1970

(MILLION GALLONS)

1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	TOTAL NO. OF PLANTS	RECIRCULATION					DISCHARGE		
			PLANTS REPORTING	INTAKE	RECYCLED 1/	GROSS USE	RECYCLE RATE	PLANTS REPORTING	INTAKE	WATER DISCHARGE
386	PHOTOGRAPHIC EQUIPMENT AND SUPPLIES	120	24	72	214	286	3	21	63	57
387	WATCHES, CLOCKS, AND WATCHCASES	9	1	*	0	*	1			
390	MISCELLANEOUS MANUFACTURING INDUSTRIES	1263	194	68 2/	8 2/	77 2/	1 2/	144	134	108 2/
391	JEWELRY, SILVERWARE, AND PLATED WARE	158	24	2	0	2	1	21	2	2
393	MUSICAL INSTRUMENTS AND PARTS	31	3	17	0	17	1	3	17	17
394	TOYS AND SPORTING GOODS	313	40	←	INC 3/	→		28	102	81
395	PENS, PENCILS, OFFICE AND ART SUPPLIES	108	27	22	*	22	1	18	11	7
396	COSTUME JEWELRY AND NOTIONS	112	14	1	0	1	1	12	*	*
399	MISCELLANEOUS MANUFACTURES	541	86	24	8	33	1	←		INC 3/ →
	MILLION GALLONS TOTAL	29786	5371	143156	816963	960120	6.7	3966	122831	84820
	ACRE FEET TOTAL			439331	2507168	2946500			376957	260305

1/ Recycled – The additional amount of water required without recirculation.

2/ Totals do not include inconclusive data.

3/ INC – inconclusive data.

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
1		ALPINE							
	24	LUMBER AND WOOD PRODUCTS	1	0	3	0	*	*	*
		TOTAL	1	0	3	0	*	*	*
2		AMADOR							
	20	FOOD AND KINDRED PRODUCTS	2	0	2	0	2	*	2
	24	LUMBER AND WOOD PRODUCTS	9	5	595	503	1518	401	1231
	27	PRINTING AND PUBLISHING	2	0	11	0	*	*	*
	28	CHEMICALS AND ALLIED PRODUCTS	1	1	104	31	533	141	432
	33	PRIMARY METAL INDUSTRIES	1	0	1	0	*	*	*
	34	FABRICATED METAL PRODUCTS	1	0	1	0	*	*	*
	35	MACHINERY, EXCEPT ELECTRICAL	1	0	1	0	*	*	*
		TOTAL	17	6	715	534	2056	543	1667
3		BUTTE							
	20	FOOD AND KINDRED PRODUCTS	20	4	685	383	2807	741	2275
	23	APPAREL AND OTHER TEXTILE PRODUCTS	2	0	2	0	*	*	*
	24	LUMBER AND WOOD PRODUCTS	32	10	1008	511	1095	289	888
	25	FURNITURE AND FIXTURES	1	0	9	0	*	*	*
	27	PRINTING AND PUBLISHING	11	2	217	58	11	2	9
	28	CHEMICALS AND ALLIED PRODUCTS	4	0	14	0	57	15	46
	29	PETROLEUM AND COAL PRODUCTS	1	0	3	0	23	6	19
	30	RUBBER AND PLASTICS PRODUCTS, NEC	2	0	2	0	*	*	*
	32	STONE, CLAY, AND GLASS PRODUCTS	4	0	81	0	46	12	37
	34	FABRICATED METAL PRODUCTS	8	3	146	133	46	12	37
	35	MACHINERY, EXCEPT ELECTRICAL	20	4	387	272	12	3	10
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	1	0	21	0	14	3	11
	37	TRANSPORTATION EQUIPMENT	1	0	2	0	*	*	*
	38	INSTRUMENTS AND RELATED PRODUCTS	2	0	18	0	*	*	*
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	4	0	195	0	10	2	8
		TOTAL	113	23	2790	1357	4126	1090	3345
4		CALAVERAS							
	24	LUMBER AND WOOD PRODUCTS	11	2	143	46	203	53	165
	27	PRINTING AND PUBLISHING	4	1	31	2	1	*	1
	32	STONE, CLAY, AND GLASS PRODUCTS	3	3	367	368	996	263	807
	33	PRIMARY METAL INDUSTRIES	1	0	12	0	1	*	1
	34	FABRICATED METAL PRODUCTS	2	0	3	0	*	*	*
	35	MACHINERY, EXCEPT ELECTRICAL	1	1	1	1	*	*	*
		TOTAL	22	7	557	417	1203	318	975
5		COLUSA							
	20	FOOD AND KINDRED PRODUCTS	3	0	53	0	59	15	48
	25	FURNITURE AND FIXTURES	1	1	2	5	*	*	*
	27	PRINTING AND PUBLISHING	2	0	15	0	*	*	*
	28	CHEMICALS AND ALLIED PRODUCTS	2	0	21	0	101	26	82

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
5		COLUSA (CONTINUED)							
	33	PRIMARY METAL INDUSTRIES	1	0	139	0	33	8	27
	35	MACHINERY, EXCEPT ELECTRICAL	6	1	34	1	1	*	1
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	1	0	2	0	*	*	*
		TOTAL	16	2	266	6	197	52	160
6		CONTRA COSTA							
	19	ORDNANCE AND ACCESSORIES	3	0	13	0	5	1	4
	20	FOOD AND KINDRED PRODUCTS	31	10	2490	1724	6313	1667	5118
	22	TEXTILE MILL PRODUCTS	1	0	3	0	*	*	*
	23	APPAREL AND OTHER TEXTILE PRODUCTS	7	1	31	11	1	*	1
	24	LUMBER AND WOOD PRODUCTS	17	3	112	27	84	22	68
	25	FURNITURE AND FIXTURES	7	1	63	11	2	*	2
	26	PAPER AND ALLIED PRODUCTS	11	7	2380	2173	63040	16653	51107
	27	PRINTING AND PUBLISHING	47	5	1200	75	43	11	34
	28	CHEMICALS AND ALLIED PRODUCTS	39	25	3503	2301	21553	5693	17474
	29	PETROLEUM AND COAL PRODUCTS	17	8	7305	4305	91954	24291	74548
	30	RUBBER AND PLASTICS PRODUCTS, NEC	11	3	106	70	1	*	*
	31	LEATHER AND LEATHER PRODUCTS	1	0	6	0	*	*	*
	32	STONE, CLAY, AND GLASS PRODUCTS	28	11	1519	1028	1741	460	1411
	33	PRIMARY METAL INDUSTRIES	9	5	3301	371	1166	308	945
	34	FABRICATED METAL PRODUCTS	35	12	2507	1194	938	247	761
	35	MACHINERY, EXCEPT ELECTRICAL	40	11	840	481	52	13	42
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	29	7	664	96	91	24	73
	37	TRANSPORTATION EQUIPMENT	25	6	777	314	665	175	539
	38	INSTRUMENTS AND RELATED PRODUCTS	20	1	526	100	58	15	47
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	6	0	41	0	6	1	5
		TOTAL	384	116	27387	14281	187722	49591	152189
7		DEL NORTE							
	20	FOOD AND KINDRED PRODUCTS	1	0	7	0	10	2	8
	24	LUMBER AND WOOD PRODUCTS	33	7	1409	818	779	205	632
	27	PRINTING AND PUBLISHING	1	0	2	0	*	*	*
	32	STONE, CLAY, AND GLASS PRODUCTS	2	1	4	2	3	*	2
	35	MACHINERY, EXCEPT ELECTRICAL	3	0	13	0	*	*	*
		TOTAL	40	8	1435	820	794	209	644
8		EL DORADO							
	20	FOOD AND KINDRED PRODUCTS	1	0	5	0	*	*	*
	24	LUMBER AND WOOD PRODUCTS	24	3	637	215	2914	743	2281
	25	FURNITURE AND FIXTURES	1	0	4	0	*	*	*
	27	PRINTING AND PUBLISHING	12	1	114	4	9	2	7
	28	CHEMICALS AND ALLIED PRODUCTS	1	0	4	0	3	*	2
	29	PETROLEUM AND COAL PRODUCTS	1	0	7	0	10	2	8
	32	STONE, CLAY, AND GLASS PRODUCTS	4	1	65	54	42	11	34

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
8		EL DORADO (CONTINUED)							
	34	FABRICATED METAL PRODUCTS	2	1	17	4	3	*	2
	35	MACHINERY, EXCEPT ELECTRICAL	6	2	20	9	1	*	1
	37	TRANSPORTATION EQUIPMENT	1	1	4	4	*	*	*
	38	INSTRUMENTS AND RELATED PRODUCTS	1	0	1	0	*	*	*
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	1	1	3	2	*	*	*
		TOTAL	55	10	881	292	2886	762	2340
9		FRESNO							
	20	FOOD AND KINDRED PRODUCTS	129	34	6175	2676	17149	4530	13903
	22	TEXTILE MILL PRODUCTS	5	0	851	0	279	73	226
	23	APPAREL AND OTHER TEXTILE PRODUCTS	9	2	887	59	34	9	27
	24	LUMBER AND WOOD PRODUCTS	52	5	1433	125	1143	301	926
	25	FURNITURE AND FIXTURES	17	4	391	216	21	5	17
	26	PAPER AND ALLIED PRODUCTS	4	1	140	14	87	23	71
	27	PRINTING AND PUBLISHING	53	7	1009	157	60	16	49
	28	CHEMICALS AND ALLIED PRODUCTS	15	4	639	254	6611	1746	5360
	29	PETROLEUM AND COAL PRODUCTS	8	0	133	0	382	259	796
	30	RUBBER AND PLASTICS PRODUCTS, NEC	5	1	184	4	5	1	4
	31	LEATHER AND LEATHER PRODUCTS	1	0	1	0	*	*	*
	32	STONE, CLAY, AND GLASS PRODUCTS	27	4	774	360	961	253	779
	33	PRIMARY METAL INDUSTRIES	9	3	277	109	38	10	31
	34	FABRICATED METAL PRODUCTS	34	4	1025	50	238	62	193
	35	MACHINERY, EXCEPT ELECTRICAL	50	10	1718	930	350	92	284
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	8	3	350	261	19	5	15
	37	TRANSPORTATION EQUIPMENT	21	1	859	6	87	23	70
	38	INSTRUMENTS AND RELATED PRODUCTS	5	1	35	4	4	1	3
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	24	7	316	189	47	12	38
		TOTAL	472	91	17197	5414	28122	7429	22799
10		GLENN							
	20	FOOD AND KINDRED PRODUCTS	10	0	329	0	2569	678	2082
	24	LUMBER AND WOOD PRODUCTS	4	0	113	0	349	92	283
	27	PRINTING AND PUBLISHING	5	0	28	0	1	*	1
	32	STONE, CLAY, AND GLASS PRODUCTS	4	0	18	0	20	5	16
	34	FABRICATED METAL PRODUCTS	2	0	38	0	2	*	2
	35	MACHINERY, EXCEPT ELECTRICAL	3	2	19	14	1	*	*
		TOTAL	28	2	545	14	2345	778	2387
11		HUMBOLDT							
	20	FOOD AND KINDRED PRODUCTS	16	6	793	140	609	160	493
	24	LUMBER AND WOOD PRODUCTS	164	23	7077	2612	7386	2083	6393
	25	FURNITURE AND FIXTURES	3	0	3	0	*	*	*
	26	PAPER AND ALLIED PRODUCTS	2	1	395	167	78352	20698	63521
	27	PRINTING AND PUBLISHING	9	0	193	0	12	3	10
	28	CHEMICALS AND ALLIED PRODUCTS	2	0	11	0	17	4	13

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
11		HUMBOLDT (CONTINUED)							
	29	PETROLEUM AND COAL PRODUCTS	1	0	49	0	73	19	59
	32	STONE, CLAY, AND GLASS PRODUCTS	5	0	52	0	56	14	45
	34	FABRICATED METAL PRODUCTS	6	2	36	10	1	*	1
	35	MACHINERY, EXCEPT ELECTRICAL	8	2	51	25	1	*	1
	37	TRANSPORTATION EQUIPMENT	3	0	31	0	2	*	1
	38	INSTRUMENTS AND RELATED PRODUCTS	1	0	4	0	*	*	*
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	3	0	39	0	18	4	14
		TOTAL	223	34	8734	2954	87032	22991	70558
12		IMPERIAL							
	20	FOOD AND KINDRED PRODUCTS	19	1	537	32	3239	855	2625
	23	APPAREL AND OTHER TEXTILE PRODUCTS	4	0	50	0	1	*	1
	24	LUMBER AND WOOD PRODUCTS	7	0	68	0	22	5	17
	27	PRINTING AND PUBLISHING	9	0	118	0	7	2	6
	28	CHEMICALS AND ALLIED PRODUCTS	6	2	256	48	1498	395	1214
	32	STONE, CLAY, AND GLASS PRODUCTS	6	2	400	324	756	199	613
	34	FABRICATED METAL PRODUCTS	2	0	4	0	*	*	*
	35	MACHINERY, EXCEPT ELECTRICAL	6	0	43	0	1	*	1
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	4	1	55	31	2	*	1
		TOTAL	63	6	1531	435	5529	1460	4483
13		INYO							
	20	FOOD AND KINDRED PRODUCTS	1	0	1	0	1	*	1
	27	PRINTING AND PUBLISHING	2	0	24	0	1	*	1
	28	CHEMICALS AND ALLIED PRODUCTS	1	0	14	0	70	18	57
	32	STONE, CLAY, AND GLASS PRODUCTS	5	0	21	0	44	11	36
	35	MACHINERY, EXCEPT ELECTRICAL	4	0	11	0	*	*	*
		TOTAL	13	0	71	0	118	31	96
14		KERN							
	19	ORDNANCE AND ACCESSORIES	1	0	2	0	*	*	*
	20	FOOD AND KINDRED PRODUCTS	38	9	1627	560	6589	1740	5342
	23	APPAREL AND OTHER TEXTILE PRODUCTS	8	2	308	156	9	2	7
	24	LUMBER AND WOOD PRODUCTS	12	2	91	3	9	2	7
	25	FURNITURE AND FIXTURES	5	0	63	0	6	1	5
	26	PAPER AND ALLIED PRODUCTS	1	0	2	0	1	*	1
	27	PRINTING AND PUBLISHING	33	8	571	372	15	4	12
	28	CHEMICALS AND ALLIED PRODUCTS	14	3	993	879	3662	967	2969
	29	PETROLEUM AND COAL PRODUCTS	17	4	732	351	4043	1068	3277
	30	RUBBER AND PLASTICS PRODUCTS, NEC	8	0	292	0	29	7	24
	32	STONE, CLAY, AND GLASS PRODUCTS	19	4	1244	291	1079	285	874
	33	PRIMARY METAL INDUSTRIES	7	1	423	320	100	26	81
	34	FABRICATED METAL PRODUCTS	15	4	130	29	23	6	18
	35	MACHINERY, EXCEPT ELECTRICAL	30	8	603	429	22	6	18
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	7	2	299	230	593	156	480

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
14		KERN (CONTINUED)							
	37	TRANSPORTATION EQUIPMENT	16	4	827	45	90	23	73
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	4	1	50	4	10	2	8
		TOTAL	235	52	8257	3669	16289	4303	13205
15		KINGS							
	20	FOOD AND KINDRED PRODUCTS	17	4	496	139	2482	655	2012
	22	TEXTILE MILL PRODUCTS	2	0	115	0	4	1	4
	23	APPAREL AND OTHER TEXTILE PRODUCTS	1	0	9	0	*	*	*
	27	PRINTING AND PUBLISHING	6	3	355	299	13	3	11
	28	CHEMICALS AND ALLIED PRODUCTS	3	2	94	23	42	11	34
	29	PETROLEUM AND COAL PRODUCTS	3	1	236	243	208	55	168
	30	RUBBER AND PLASTICS PRODUCTS, NEC	1	1	645	738	196	52	159
	32	STONE, CLAY, AND GLASS PRODUCTS	4	3	94	23	405	107	328
	33	PRIMARY METAL INDUSTRIES	1	1	1	2	*	*	*
	34	FABRICATED METAL PRODUCTS	2	1	10	5	2	*	2
	35	MACHINERY, EXCEPT ELECTRICAL	5	1	38	9	1	*	1
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	1	1	2	2	*	*	*
		TOTAL	46	18	2095	1483	3358	887	2722
16		LAKE							
	20	FOOD AND KINDRED PRODUCTS	4	0	34	0	44	11	36
	24	LUMBER AND WOOD PRODUCTS	3	1	17	23	1	*	1
	25	FURNITURE AND FIXTURES	2	0	10	0	*	*	*
	27	PRINTING AND PUBLISHING	4	0	17	0	1	*	*
	30	RUBBER AND PLASTICS PRODUCTS, NEC	1	1	13	11	1	*	*
	32	STONE, CLAY, AND GLASS PRODUCTS	3	1	9	1	35	9	29
	34	FABRICATED METAL PRODUCTS	1	0	6	0	*	*	*
	35	MACHINERY, EXCEPT ELECTRICAL	2	0	4	0	*	*	*
	37	TRANSPORTATION EQUIPMENT	3	0	24	0	1	*	1
	38	INSTRUMENTS AND RELATED PRODUCTS	1	0	1	0	*	*	*
		TOTAL	24	3	135	35	87	23	71
17		LASSEN							
	20	FOOD AND KINDRED PRODUCTS	1	0	9	0	13	3	10
	24	LUMBER AND WOOD PRODUCTS	14	3	371	244	4997	1320	4051
	27	PRINTING AND PUBLISHING	2	0	11	0	*	*	*
	32	STONE, CLAY, AND GLASS PRODUCTS	1	0	4	0	4	1	3
	35	MACHINERY, EXCEPT ELECTRICAL	1	0	1	0	*	*	*
		TOTAL	19	3	396	244	5016	1325	4066
18		MADERA							
	20	FOOD AND KINDRED PRODUCTS	14	1	821	75	1923	508	1559
	24	LUMBER AND WOOD PRODUCTS	14	3	264	72	430	113	348
	27	PRINTING AND PUBLISHING	5	0	55	0	3	*	2
	30	RUBBER AND PLASTICS PRODUCTS, NEC	1	0	13	0	*	*	*

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
18		MADERA (CONTINUED)							
	32	STONE, CLAY, AND GLASS PRODUCTS	7	1	50	6	47	12	38
	35	MACHINERY, EXCEPT ELECTRICAL	4	0	157	0	15	4	12
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	1	1	9	7	1	*	*
		TOTAL	46	6	1369	160	2422	639	1963
19		MARIN							
	20	FOOD AND KINDRED PRODUCTS	16	4	209	58	177	46	143
	23	APPAREL AND OTHER TEXTILE PRODUCTS	6	1	35	4	1	*	*
	24	LUMBER AND WOOD PRODUCTS	5	0	33	0	129	34	104
	25	FURNITURE AND FIXTURES	7	2	62	34	5	1	4
	26	PAPER AND ALLIED PRODUCTS	2	0	22	0	2	*	1
	27	PRINTING AND PUBLISHING	42	6	482	213	58	15	47
	30	RUBBER AND PLASTICS PRODUCTS, NEC	11	5	213	150	41	10	33
	31	LEATHER AND LEATHER PRODUCTS	3	0	15	0	*		*
	32	STONE, CLAY, AND GLASS PRODUCTS	14	5	237	134	263	69	213
	33	PRIMARY METAL INDUSTRIES	2	0	88	0	46	12	37
	34	FABRICATED METAL PRODUCTS	9	1	78	16	26	7	21
	35	MACHINERY, EXCEPT ELECTRICAL	10	3	173	107	5	1	4
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	9	3	755	121	132	35	107
	37	TRANSPORTATION EQUIPMENT	12	2	92	29	1	*	*
	38	INSTRUMENTS AND RELATED PRODUCTS	5	1	482	9	63	16	51
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	12	1	102	5	30	8	24
		TOTAL	165	34	3078	880	987	260	800
20		MARIPOSA							
	24	LUMBER AND WOOD PRODUCTS	5	0	38	0	106	28	86
	27	PRINTING AND PUBLISHING	1	1	5	5	*	*	*
	35	MACHINERY, EXCEPT ELECTRICAL	1	0	4	0	*	*	*
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	1	1	5	6	*	*	*
		TOTAL	8	2	52	11	106	28	86
21		MENDOCINO							
	20	FOOD AND KINDRED PRODUCTS	14	3	138	40	89	23	72
	22	TEXTILE MILL PRODUCTS	1	1	14	18	*	*	*
	24	LUMBER AND WOOD PRODUCTS	88	18	3707	2149	10584	2796	8581
	25	FURNITURE AND FIXTURES	1	0	295	0	14	3	11
	27	PRINTING AND PUBLISHING	6	0	73	0	4	1	3
	28	CHEMICALS AND ALLIED PRODUCTS	1	0	18	0	2	*	2
	31	LEATHER AND LEATHER PRODUCTS	1	0	3	0	*	*	*
	32	STONE, CLAY, AND GLASS PRODUCTS	6	2	32	14	5	1	4
	34	FABRICATED METAL PRODUCTS	1	1	5	4	*	*	*
	35	MACHINERY, EXCEPT ELECTRICAL	6	2	223	178	26	7	21
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	1	1	1	3	*	*	*
	38	INSTRUMENTS AND RELATED PRODUCTS	1	1	10	10	*	*	*
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	1	0	2	0	*	*	*
		TOTAL	128	29	4519	2416	10729	2834	8698

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
22		MERCED							
	20	FOOD AND KINDRED PRODUCTS	28	4	4236	1400	9530	2517	7726
	22	TEXTILE MILL PRODUCTS	2	0	113	0	3	*	2
	23	APPAREL AND OTHER TEXTILE PRODUCTS	1	0	96	0	2	*	2
	24	LUMBER AND WOOD PRODUCTS	1	0	1	0	*	*	*
	25	FURNITURE AND FIXTURES	2	1	10	7	*	*	*
	26	PAPER AND ALLIED PRODUCTS	1	1	69	55	4	1	3
	27	PRINTING AND PUBLISHING	9	3	180	126	7	1	5
	28	CHEMICALS AND ALLIED PRODUCTS	3	1	193	1	92	24	75
	32	STONE, CLAY, AND GLASS PRODUCTS	8	2	59	9	98	25	79
	33	PRIMARY METAL INDUSTRIES	1	0	32	0	33	8	26
	34	FABRICATED METAL PRODUCTS	5	0	324	0	82	21	67
	35	MACHINERY, EXCEPT ELECTRICAL	9	4	112	35	3	*	2
	37	TRANSPORTATION EQUIPMENT	3	0	79	0	10	2	8
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	1	0	7	0	*	*	*
		TOTAL	74	16	5511	1633	9869	2607	8001
23		MODOC							
	24	LUMBER AND WOOD PRODUCTS	9	3	175	11	493	130	400
	27	PRINTING AND PUBLISHING	1	0	5	0	*	*	*
	32	STONE, CLAY, AND GLASS PRODUCTS	1	0	14	0	16	4	12
	35	MACHINERY, EXCEPT ELECTRICAL	1	0	1	0	*	*	*
		TOTAL	12	3	195	11	510	134	413
24		MONO							
	20	FOOD AND KINDRED PRODUCTS	1	0	6	0	1	*	1
	32	STONE, CLAY, AND GLASS PRODUCTS	2	1	23	7	*	*	*
	35	MACHINERY, EXCEPT ELECTRICAL	1	0	4	0	*	*	*
		TOTAL	4	1	33	7	2	*	2
25		MONTEREY							
	20	FOOD AND KINDRED PRODUCTS	39	7	2967	1039	13897	3671	11266
	23	APPAREL AND OTHER TEXTILE PRODUCTS	5	2	267	118	4	1	4
	24	LUMBER AND WOOD PRODUCTS	10	3	167	137	30	8	24
	25	FURNITURE AND FIXTURES	5	0	138	0	4	1	3
	26	PAPER AND ALLIED PRODUCTS	2	2	153	158	233	61	189
	27	PRINTING AND PUBLISHING	25	4	613	37	36	9	29
	28	CHEMICALS AND ALLIED PRODUCTS	7	3	432	309	3466	915	2810
	30	RUBBER AND PLASTICS PRODUCTS, NEC	4	0	998	0	611	161	495
	32	STONE, CLAY, AND GLASS PRODUCTS	14	2	370	133	628	165	509
	33	PRIMARY METAL INDUSTRIES	2	1	80	113	6	1	5
	34	FABRICATED METAL PRODUCTS	5	1	44	14	11	3	9
	35	MACHINERY, EXCEPT ELECTRICAL	16	2	594	64	21	5	17
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	3	0	95	0	8	2	6
	37	TRANSPORTATION EQUIPMENT	3	2	10	10	*	*	*

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
25		MONTEREY (CONTINUED)							
	38	INSTRUMENTS AND RELATED PRODUCTS	2	0	21	0	*	*	*
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	8	1	32	3	1	*	1
		TOTAL	150	30	6981	2135	18965	5010	15375
26		NAPA							
	20	FOOD AND KINDRED PRODUCTS	27	10	659	273	523	138	424
	22	TEXTILE MILL PRODUCTS	1	0	37	0	1	*	1
	23	APPAREL AND OTHER TEXTILE PRODUCTS	3	1	616	4	24	6	19
	24	LUMBER AND WOOD PRODUCTS	1	1	24	24	*	*	*
	25	FURNITURE AND FIXTURES	1	0	21	0	1	*	*
	26	PAPER AND ALLIED PRODUCTS	2	0	24	0	1	*	1
	27	PRINTING AND PUBLISHING	10	2	159	11	8	2	7
	28	CHEMICALS AND ALLIED PRODUCTS	1	0	2	0	2	*	2
	30	RUBBER AND PLASTICS PRODUCTS, NEC	1	0	11	0	1	*	1
	31	LEATHER AND LEATHER PRODUCTS	3	0	111	0	311	82	252
	32	STONE, CLAY, AND GLASS PRODUCTS	3	0	418	0	110	29	89
	33	PRIMARY METAL INDUSTRIES	2	1	761	753	114	30	93
	34	FABRICATED METAL PRODUCTS	3	1	52	17	4	1	3
	35	MACHINERY, EXCEPT ELECTRICAL	4	0	43	0	3	*	2
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	3	3	75	62	2	*	1
	37	TRANSPORTATION EQUIPMENT	1	0	4	0	*	*	*
	38	INSTRUMENTS AND RELATED PRODUCTS	2	0	15	0	*	*	*
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	3	0	24	0	1	*	*
		TOTAL	71	19	3056	1144	1114	294	903
27		NEVADA							
	20	FOOD AND KINDRED PRODUCTS	1	0	6	0	8	2	7
	24	LUMBER AND WOOD PRODUCTS	12	3	361	177	172	45	140
	27	PRINTING AND PUBLISHING	6	0	48	0	2	*	2
	28	CHEMICALS AND ALLIED PRODUCTS	1	0	1	0	*	*	*
	29	PETROLEUM AND COAL PRODUCTS	1	0	5	0	7	1	6
	32	STONE, CLAY, AND GLASS PRODUCTS	3	0	3	0	1	*	1
	33	PRIMARY METAL INDUSTRIES	1	0	5	0	*	*	*
	34	FABRICATED METAL PRODUCTS	3	0	15	0	2	*	2
	35	MACHINERY, EXCEPT ELECTRICAL	1	0	13	0		*	*
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	2	0	110	0	11	2	9
		TOTAL	31	3	567	177	208	55	169
28		ORANGE							
	19	ORDNANCE AND ACCESSORIES	7	1	7976	396	988	261	801
	20	FOOD AND KINDRED PRODUCTS	100	18	7058	1277	9859	2604	7993
	21	TOBACCO MANUFACTURES	1	0	20	0	15	4	12
	22	TEXTILE MILL PRODUCTS	13	2	714	62	24	6	19
	23	APPAREL AND OTHER TEXTILE PRODUCTS	65	3	1251	67	45	11	36
	24	LUMBER AND WOOD PRODUCTS	63	7	1069	196	167	44	135

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
28		ORANGE (CONTINUED)							
	25	FURNITURE AND FIXTURES	58	2	841	57	32	8	26
	26	PAPER AND ALLIED PRODUCTS	28	13	2459	1521	8910	2353	7224
	27	PRINTING AND PUBLISHING	207	15	5033	677	208	55	168
	28	CHEMICALS AND ALLIED PRODUCTS	76	27	2447	1084	3629	958	2942
	29	PETROLEUM AND COAL PRODUCTS	16	0	787	0	5912	1561	4793
	30	RUBBER AND PLASTICS PRODUCTS, NEC	124	24	5411	947	736	194	597
	31	LEATHER AND LEATHER PRODUCTS	8	1	26	1	1		
	32	STONE, CLAY, AND GLASS PRODUCTS	79	12	2454	354	905	239	734
	33	PRIMARY METAL INDUSTRIES	38	5	1545	133	438	115	355
	34	FABRICATED METAL PRODUCTS	206	22	7946	1541	2082	550	1688
	35	MACHINERY, EXCEPT ELECTRICAL	393	30	10362	1168	1483	391	1202
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	209	13	37360	2561	3343	883	2710
	37	TRANSPORTATION EQUIPMENT	171	10	11971	3763	1914	505	1552
	38	INSTRUMENTS AND RELATED PRODUCTS	83	4	6454	53	381	100	309
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	100	14	4617	1242	2538	670	2057
		TOTAL	2045	223	117801	17100	43621	11523	35364
29		PLACER							
	20	FOOD AND KINDRED PRODUCTS	5	0	34	0	25	6	20
	24	LUMBER AND WOOD PRODUCTS	19	1	919	163	189	50	153
	25	FURNITURE AND FIXTURES	2	0	4	0	*	*	*
	27	PRINTING AND PUBLISHING	11	0	115	0	9	2	7
	28	CHEMICALS AND ALLIED PRODUCTS	1	0	8	0	*	*	*
	30	RUBBER AND PLASTICS PRODUCTS, NEC	3	0	410	0	46	12	37
	32	STONE, CLAY, AND GLASS PRODUCTS	5	1	345	3	56	14	45
	33	PRIMARY METAL INDUSTRIES	3	1	95	4	21	5	17
	34	FABRICATED METAL PRODUCTS	2	0	13	0	1	*	*
	35	MACHINERY, EXCEPT ELECTRICAL	4	1	12	6	*	*	*
	37	TRANSPORTATION EQUIPMENT	5	0	75	0	4	1	3
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	1	0	1	0	*	*	*
		TOTAL	61	4	2031	176	355	93	287
30		PLUMAS							
	20	FOOD AND KINDRED PRODUCTS	1	0	1	0	1	*	1
	24	LUMBER AND WOOD PRODUCTS	29	2	921	75	2839	750	2301
	27	PRINTING AND PUBLISHING	1	0	11	0	*	*	*
	32	STONE, CLAY, AND GLASS PRODUCTS	1	0	3	0	3	*	2
		TOTAL	32	2	936	75	2844	751	2306
31		RIVERSIDE							
	19	ORDNANCE AND ACCESSORIES	2	0	6	0	*	*	*
	20	FOOD AND KINDRED PRODUCTS	40	9	1570	585	2570	678	2083
	22	TEXTILE MILL PRODUCTS	2	1	74	67	7	1	5
	23	APPAREL AND OTHER TEXTILE PRODUCTS	11	1	562	57	17	4	14
	24	LUMBER AND WOOD PRODUCTS	15	0	702	0	108	28	88

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
31		RIVERSIDE (CONTINUED)							
	25	FURNITURE AND FIXTURES	13	0	157	0	5	1	4
	26	PAPER AND ALLIED PRODUCTS	3	0	603	0	248	65	201
	27	PRINTING AND PUBLISHING	50	3	1369	134	44	11	36
	28	CHEMICALS AND ALLIED PRODUCTS	14	4	517	160	446	118	362
	29	PETROLEUM AND COAL PRODUCTS	4	0	5	0	39	10	32
	30	RUBBER AND PLASTICS PRODUCTS, NEC	17	2	452	46	18	4	14
	32	STONE, CLAY, AND GLASS PRODUCTS	34	5	1947	573	3931	1038	3187
	33	PRIMARY METAL INDUSTRIES	18	7	2366	1246	1446	382	1172
	34	FABRICATED METAL PRODUCTS	32	2	577	22	102	27	83
	35	MACHINERY, EXCEPT ELECTRICAL	52	2	1161	341	187	49	151
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	13	1	1930	41	89	23	72
	37	TRANSPORTATION EQUIPMENT	56	2	5357	203	507	133	411
	38	INSTRUMENTS AND RELATED PRODUCTS	9	1	149	7	32	8	26
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	8	0	241	0	14	3	11
		TOTAL	393	40	19745	3482	9819	2594	7960
32		SACRAMENTO							
	19	ORDNANCE AND ACCESSORIES	3	0	180	0	21	5	17
	20	FOOD AND KINDRED PRODUCTS	64	11	4981	3309	15717	4152	12742
	23	APPAREL AND OTHER TEXTILE PRODUCTS	14	0	168	0	5	1	4
	24	LUMBER AND WOOD PRODUCTS	26	4	683	42	382	101	310
	25	FURNITURE AND FIXTURES	19	3	268	25	10	2	8
	26	PAPER AND ALLIED PRODUCTS	3	0	290	0	1494	394	1211
	27	PRINTING AND PUBLISHING	62	2	2051	317	55	14	44
	28	CHEMICALS AND ALLIED PRODUCTS	10	3	593	439	3955	1018	3125
	29	PETROLEUM AND COAL PRODUCTS	9	1	140	13	24	6	20
	30	RUBBER AND PLASTICS PRODUCTS, NEC	10	1	184	13	5	1	4
	31	LEATHER AND LEATHER PRODUCTS	1	0	1	0	*	*	*
	32	STONE, CLAY, AND GLASS PRODUCTS	29	2	475	47	530	140	430
	33	PRIMARY METAL INDUSTRIES	5	0	118	0	45	11	36
	34	FABRICATED METAL PRODUCTS	40	9	1171	141	297	78	241
	35	MACHINERY, EXCEPT ELECTRICAL	28	2	493	57	20	5	16
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	6	0	101	0	8	2	7
	37	TRANSPORTATION EQUIPMENT	23	3	4508	87	571	150	463
	38	INSTRUMENTS AND RELATED PRODUCTS	5	0	59	0	2	*	2
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	16	1	127	2	6	1	5
		TOTAL	373	42	16591	4492	23057	6091	18692
33		SAN BENITO							
	19	ORDNANCE AND ACCESSORIES	2	0	140	0	89	23	72
	20	FOOD AND KINDRED PRODUCTS	9	3	542	465	1926	509	1562
	26	PAPER AND ALLIED PRODUCTS	1	0	35	0	1	*	*
	27	PRINTING AND PUBLISHING	1	1	34	34	*	*	*
	28	CHEMICALS AND ALLIED PRODUCTS	3	1	374	14	31	8	25
	32	STONE, CLAY, AND GLASS PRODUCTS	1	0	148	0	627	165	508

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
33		SAN BENITO (CONTINUED)							
	35	MACHINERY, EXCEPT ELECTRICAL	2	0	25	0	3	*	2
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	1	1	14	15	*	*	*
	37	TRANSPORTATION EQUIPMENT	1	0	5	0	*	*	*
		TOTAL	21	6	1317	528	2681	708	2173
34		SAN BERNARDINO							
	19	ORDNANCE AND ACCESSORIES	2	0	138	0	101	26	82
	20	FOOD AND KINDRED PRODUCTS	67	16	2717	1385	3818	1008	3095
	22	TEXTILE MILL PRODUCTS	3	1	271	191	86	22	69
	23	APPAREL AND OTHER TEXTILE PRODUCTS	23	1	774	30	22	5	18
	24	LUMBER AND WOOD PRODUCTS	28	4	517	252	76	20	62
	25	FURNITURE AND FIXTURES	23	3	461	49	16	4	13
	26	PAPER AND ALLIED PRODUCTS	13	5	487	220	29	7	23
	27	PRINTING AND PUBLISHING	56	3	1250	43	56	14	45
	28	CHEMICALS AND ALLIED PRODUCTS	26	13	1539	1139	2399	633	1945
	29	PETROLEUM AND COAL PRODUCTS	3	0	67	0	111	29	90
	30	RUBBER AND PLASTICS PRODUCTS, NEC	25	4	996	238	54	14	44
	31	LEATHER AND LEATHER PRODUCTS	3	1	26	6	*	*	*
	32	STONE, CLAY, AND GLASS PRODUCTS	52	9	2742	613	12685	3351	10284
	33	PRIMARY METAL INDUSTRIES	24	6	9589	11709	12066	3187	9782
	34	FABRICATED METAL PRODUCTS	75	13	1989	197	541	143	438
	35	MACHINERY, EXCEPT ELECTRICAL	83	12	1457	204	75	19	60
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	23	3	1451	1086	797	210	646
	37	TRANSPORTATION EQUIPMENT	47	5	4707	196	463	122	376
	38	INSTRUMENTS AND RELATED PRODUCTS	9	4	122	54	6	1	5
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	24	6	652	114	198	52	161
		TOTAL	609	109	31952	17726	33609	8878	27247
35		SAN JOAQUIN							
	20	FOOD AND KINDRED PRODUCTS	82	21	6770	2249	28098	7422	22779
	23	APPAREL AND OTHER TEXTILE PRODUCTS	4	0	113	0	3	*	3
	24	LUMBER AND WOOD PRODUCTS	30	4	1427	481	683	180	553
	25	FURNITURE AND FIXTURES	5	1	240	179	3	*	2
	26	PAPER AND ALLIED PRODUCTS	6	4	1295	1048	2307	609	1870
	27	PRINTING AND PUBLISHING	29	9	649	99	21	5	17
	28	CHEMICALS AND ALLIED PRODUCTS	12	3	647	44	5363	1416	4348
	29	PETROLEUM AND COAL PRODUCTS	3	0	10	0	53	14	43
	30	RUBBER AND PLASTICS PRODUCTS, NEC	8	2	394	106	580	153	470
	32	STONE, CLAY, AND GLASS PRODUCTS	15	3	1514	332	1388	366	1125
	33	PRIMARY METAL INDUSTRIES	7	0	149	0	49	12	39
	34	FABRICATED METAL PRODUCTS	20	3	789	142	315	83	255
	35	MACHINERY, EXCEPT ELECTRICAL	36	4	1554	145	82	21	66
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	9	1	197	24	9	2	7
	37	TRANSPORTATION EQUIPMENT	14	1	704	1	180	47	146

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
35		SAN JOAQUIN (CONTINUED)							
	38	INSTRUMENTS AND RELATED PRODUCTS	1	0	3	0	*	*	*
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	10	1	214	8	9	2	7
		TOTAL	291	57	16668	4858	39149	10342	31739
36		SAN LUIS OBISPO							
	20	FOOD AND KINDRED PRODUCTS	12	2	147	12	175	46	142
	24	LUMBER AND WOOD PRODUCTS	3	0	10	0	1	*	1
	25	FURNITURE AND FIXTURES	2	0	281	0	20	5	16
	27	PRINTING AND PUBLISHING	12	0	328	0	18	4	14
	28	CHEMICALS AND ALLIED PRODUCTS	3	1	26	3	106	28	86
	29	PETROLEUM AND COAL PRODUCTS	4	2	131	99	2319	612	1880
	32	STONE, CLAY, AND GLASS PRODUCTS	7	2	59	20	7	1	5
	33	PRIMARY METAL INDUSTRIES	1	0	8	0	1	*	1
	34	FABRICATED METAL PRODUCTS	5	0	6	0	*	*	*
	35	MACHINERY, EXCEPT ELECTRICAL	3	0	11	0	*	*	*
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	2	0	149	0	5	1	4
	37	TRANSPORTATION EQUIPMENT	2	0	47	0	3	*	3
	38	INSTRUMENTS AND RELATED PRODUCTS	1	0	3	0	*	*	*
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	2	1	8	1	*	*	*
		TOTAL	59	8	1214	135	2662	703	2158
37		SAN MATEO							
	19	ORDNANCE AND ACCESSORIES	1	0	28	0	1	*	1
	20	FOOD AND KINDRED PRODUCTS	50	18	2863	2170	2854	754	2313
	22	TEXTILE MILL PRODUCTS	4	0	172	0	12	3	9
	23	APPAREL AND OTHER TEXTILE PRODUCTS	12	3	280	85	7	2	6
	24	LUMBER AND WOOD PRODUCTS	24	5	262	42	9	2	8
	25	FURNITURE AND FIXTURES	26	3	611	85	17	4	14
	26	PAPER AND ALLIED PRODUCTS	19	7	833	416	127	33	103
	27	PRINTING AND PUBLISHING	90	8	2554	368	127	33	103
	28	CHEMICALS AND ALLIED PRODUCTS	41	18	2585	1488	3011	795	2441
	29	PETROLEUM AND COAL PRODUCTS	8	2	482	25	3671	969	2976
	30	RUBBER AND PLASTICS PRODUCTS, NEC	24	7	820	224	122	32	99
	31	LEATHER AND LEATHER PRODUCTS	3	2	75	71	76	20	62
	32	STONE, CLAY, AND GLASS PRODUCTS	25	4	1345	145	1379	364	1118
	33	PRIMARY METAL INDUSTRIES	16	7	2385	1939	1242	328	1007
	34	FABRICATED METAL PRODUCTS	93	12	2389	186	478	126	388
	35	MACHINERY, EXCEPT ELECTRICAL	163	16	2339	129	304	80	247
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	74	9	10797	371	540	142	438
	37	TRANSPORTATION EQUIPMENT	18	0	630	0	71	18	57
	38	INSTRUMENTS AND RELATED PRODUCTS	20	1	301	2	18	4	14
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	31	4	732	48	38	10	31
		TOTAL	742	126	32483	7794	14114	3728	11443

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
38		SANTA BARBARA							
	19	ORDNANCE AND ACCESSORIES	5	0	2079	0	181	48	147
	20	FOOD AND KINDRED PRODUCTS	33	3	1477	349	5939	1568	4814
	22	TEXTILE MILL PRODUCTS	1	0	3	0	2	*	1
	23	APPAREL AND OTHER TEXTILE PRODUCTS	5	1	24	11	*	*	*
	24	LUMBER AND WOOD PRODUCTS	10	3	83	15	9	2	7
	25	FURNITURE AND FIXTURES	4	1	36	2	23	6	19
	26	PAPER AND ALLIED PRODUCTS	2	1	21	12	1	*	*
	27	PRINTING AND PUBLISHING	38	5	820	80	40	10	32
	28	CHEMICALS AND ALLIED PRODUCTS	2	0	6	0	1	*	1
	29	PETROLEUM AND COAL PRODUCTS	7	2	95	76	117	31	95
	30	RUBBER AND PLASTICS PRODUCTS, NEC	5	0	128	0	14	3	11
	31	LEATHER AND LEATHER PRODUCTS	1	1	16	16	*	*	*
	32	STONE, CLAY, AND GLASS PRODUCTS	11	1	904	46	3439	908	2788
	33	PRIMARY METAL INDUSTRIES	3	1	178	100	114	30	92
	34	FABRICATED METAL PRODUCTS	17	2	197	22	36	9	29
	35	MACHINERY, EXCEPT ELECTRICAL	28	3	414	19	26	7	21
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	29	4	2691	78	416	109	337
	37	TRANSPORTATION EQUIPMENT	11	3	388	50	51	13	41
	38	INSTRUMENTS AND RELATED PRODUCTS	9	1	347	4	22	5	18
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	17	5	420	18	13	3	11
		TOTAL	238	37	10327	898	10453	2761	8474
39		SANTA CLARA							
	19	ORDNANCE AND ACCESSORIES	3	4	20691	16918	2594	685	2103
	20	FOOD AND KINDRED PRODUCTS	132	44	13934	5878	21368	5644	17323
	22	TEXTILE MILL PRODUCTS	1	0	2	0	*	*	*
	23	APPAREL AND OTHER TEXTILE PRODUCTS	18	2	574	22	24	6	19
	24	LUMBER AND WOOD PRODUCTS	36	10	554	255	18	4	15
	25	FURNITURE AND FIXTURES	34	8	334	59	17	4	13
	26	PAPER AND ALLIED PRODUCTS	27	12	2215	732	5338	1410	4328
	27	PRINTING AND PUBLISHING	161	32	4450	945	864	228	700
	28	CHEMICALS AND ALLIED PRODUCTS	48	10	2109	721	3063	809	2483
	29	PETROLEUM AND COAL PRODUCTS	9	0	67	0	231	61	187
	30	RUBBER AND PLASTICS PRODUCTS, NEC	34	5	1481	416	233	61	189
	31	LEATHER AND LEATHER PRODUCTS	1	0	0	0	0	0	0
	32	STONE, CLAY, AND GLASS PRODUCTS	55	13	2612	1150	4662	1231	3779
	33	PRIMARY METAL INDUSTRIES	23	6	739	285	211	55	171
	34	FABRICATED METAL PRODUCTS	123	25	2802	593	381	100	308
	35	MACHINERY, EXCEPT ELECTRICAL	285	65	15584	9651	2147	567	1740
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	212	56	47925	9957	5864	1549	4754
	37	TRANSPORTATION EQUIPMENT	35	8	4618	851	684	180	554
	38	INSTRUMENTS AND RELATED PRODUCTS	66	14	2745	887	546	144	443
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	36	5	538	190	89	23	72
		TOTAL	1339	319	123974	49510	48341	12770	39191

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
40		SANTA CRUZ							
	19	ORDNANCE AND ACCESSORIES	1	0	304	0	26	7	21
	20	FOOD AND KINDRED PRODUCTS	34	7	3046	450	1799	475	1458
	22	TEXTILE MILL PRODUCTS	0	0	0	0	0	0	0
	23	APPAREL AND OTHER TEXTILE PRODUCTS	3	3	126	126	3	1	3
	24	LUMBER AND WOOD PRODUCTS	22	4	397	77	28	7	23
	25	FURNITURE AND FIXTURES	6	2	337	115	13	3	11
	26	PAPER AND ALLIED PRODUCTS	1	1	8	14	20	5	16
	27	PRINTING AND PUBLISHING	18	2	284	224	29	7	23
	28	CHEMICALS AND ALLIED PRODUCTS	4	0	14	0	9	2	7
	29	PETROLEUM AND COAL PRODUCTS	1	0	4	0	31	8	25
	30	RUBBER AND PLASTICS PRODUCTS, NEC	3	1	60	23	23	6	19
	31	LEATHER AND LEATHER PRODUCTS	5	1	236	225	1173	310	951
	32	STONE, CLAY, AND GLASS PRODUCTS	6	2	311	35	1068	282	866
	33	PRIMARY METAL INDUSTRIES	2	2	98	184	249	65	202
	34	FABRICATED METAL PRODUCTS	10	2	70	50	37	9	30
	35	MACHINERY, EXCEPT ELECTRICAL	9	2	86	19	6	1	5
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	9	5	891	324	40	10	32
	37	TRANSPORTATION EQUIPMENT	5	0	10	0	*	*	*
	38	INSTRUMENTS AND RELATED PRODUCTS	3	1	56	11	3	*	2
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	6	2	26	7	8	2	6
		TOTAL	148	37	6364	1884	4575	1208	3709
41		SHASTA							
	20	FOOD AND KINDRED PRODUCTS	6	1	135	60	200	52	162
	23	APPAREL AND OTHER TEXTILE PRODUCTS	1	1	0	2	*	*	*
	24	LUMBER AND WOOD PRODUCTS	68	7	2830	386	20038	5293	16245
	25	FURNITURE AND FIXTURES	1	0	2	0	*	*	*
	26	PAPER AND ALLIED PRODUCTS	1	1	434	434	14865	3927	12052
	27	PRINTING AND PUBLISHING	8	1	155	1	9	2	7
	30	RUBBER AND PLASTICS PRODUCTS, NEC	2	1	24	11	*	*	*
	32	STONE, CLAY, AND GLASS PRODUCTS	5	1	132	93	158	41	128
	33	PRIMARY METAL INDUSTRIES	1	1	34	34	1	*	*
	34	FABRICATED METAL PRODUCTS	6	1	38	1	42	11	34
	35	MACHINERY, EXCEPT ELECTRICAL	2	0	E	0	*	*	*
	37	TRANSPORTATION EQUIPMENT	2	0	95	0	7	2	6
	38	INSTRUMENTS AND RELATED PRODUCTS	1	0	41	0	1	*	1
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	3	0	5	0	*	*	*
		TOTAL	107	15	3931	1022	35326	9332	28639
42		SIERRA							
	24	LUMBER AND WOOD PRODUCTS	5	1	275	5	946	250	767
	32	STONE, CLAY, AND GLASS PRODUCTS	1	0	12	0	13	3	11
		TOTAL	6	1	287	5	960	253	778

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
43		SISKIYOU							
	20	FOOD AND KINDRED PRODUCTS	11	2	117	50	398	105	323
	24	LUMBER AND WOOD PRODUCTS	54	7	2400	617	7269	1920	5893
	27	PRINTING AND PUBLISHING	7	1	21	6	*	*	*
	29	PETROLEUM AND COAL PRODUCTS	1	0	4	0	5	1	4
	32	STONE, CLAY, AND GLASS PRODUCTS	3	0	8	0	9	2	7
	34	FABRICATED METAL PRODUCTS	2	0	7	0	*	*	*
	35	MACHINERY, EXCEPT ELECTRICAL	1	0	5	0	*	*	*
		TOTAL	79	10	2562	673	7685	2030	6230
44		SOLANO							
	20	FOOD AND KINDRED PRODUCTS	22	7	1984	755	4704	1242	3813
	24	LUMBER AND WOOD PRODUCTS	3	0	16	0	2	*	2
	25	FURNITURE AND FIXTURES	6	2	60	21	3	*	2
	26	PAPER AND ALLIED PRODUCTS	2	1	8	4	*	*	*
	27	PRINTING AND PUBLISHING	12	2	380	238	6	1	5
	28	CHEMICALS AND ALLIED PRODUCTS	1	0	114	0	3	1	3
	29	PETROLEUM AND COAL PRODUCTS	1	0	359	0	2842	750	2304
	31	LEATHER AND LEATHER PRODUCTS	1	0	27	0	111	29	90
	32	STONE, CLAY, AND GLASS PRODUCTS	6	0	293	0	326	86	264
	33	PRIMARY METAL INDUSTRIES	2	0	49	0	36	9	29
	34	FABRICATED METAL PRODUCTS	8	1	438	288	29	7	23
	35	MACHINERY, EXCEPT ELECTRICAL	5	2	99	82	15	4	12
	37	TRANSPORTATION EQUIPMENT	6	0	21	0	1	*	1
	38	INSTRUMENTS AND RELATED PRODUCTS	2	0	97	0	13	3	10
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	5	2	89	16	18	4	15
		TOTAL	82	17	4034	1404	8116	2144	6580
45		SONOMA							
	19	ORDNANCE AND ACCESSORIES	1	0	3	0	*	*	
	20	FOOD AND KINDRED PRODUCTS	68	15	1574	168	2227	588	1805
	22	TEXTILE MILL PRODUCTS	1	0	50	0	2	*	1
	23	APPAREL AND OTHER TEXTILE PRODUCTS	5	1	22	3	*	*	*
	24	LUMBER AND WOOD PRODUCTS	63	13	2090	406	184	48	149
	25	FURNITURE AND FIXTURES	9	0	85	0	4	1	3
	27	PRINTING AND PUBLISHING	28	3	446	21	27	7	22
	28	CHEMICALS AND ALLIED PRODUCTS	5	0	43	0	21	5	17
	30	RUBBER AND PLASTICS PRODUCTS, NEC	7	1	44	3	2	*	1
	31	LEATHER AND LEATHER PRODUCTS	2	0	239	0	7	1	5
	32	STONE, CLAY, AND GLASS PRODUCTS	14	3	139	35	27	7	22
	33	PRIMARY METAL INDUSTRIES	4	0	49	0	5	1	4
	34	FABRICATED METAL PRODUCTS	19	7	361	136	28	7	23
	35	MACHINERY, EXCEPT ELECTRICAL	33	10	397	83	40	10	32
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	6	0	333	0	63	16	51
	37	TRANSPORTATION EQUIPMENT	7	1	211	1	11	2	8

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
45		SONOMA (CONTINUED)							
	38	INSTRUMENTS AND RELATED PRODUCTS	9	3	415	34	14	3	11
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	13	2	131	17	25	6	20
		TOTAL	294	59	6632	907	2692	711	2182
46		STANISLAUS							
	19	ORDNANCE AND ACCESSORIES	1	0	496	0	16	4	13
	20	FOOD AND KINDRED PRODUCTS	77	23	9166	3814	45174	11933	36623
	23	APPAREL AND OTHER TEXTILE PRODUCTS	1	0	3	0	*	*	*
	24	LUMBER AND WOOD PRODUCTS	15	4	334	49	341	90	276
	25	FURNITURE AND FIXTURES	7	2	121	6	9	2	7
	26	PAPER AND ALLIED PRODUCTS	6	3	599	229	435	114	352
	27	PRINTING AND PUBLISHING	20	2	527	4	27	7	22
	28	CHEMICALS AND ALLIED PRODUCTS	6	4	440	225	1495	394	1212
	30	RUBBER AND PLASTICS PRODUCTS, NEC	4	0	86	0	30	8	24
	32	STONE, CLAY, AND GLASS PRODUCTS	14	5	909	473	1540	406	1248
	33	PRIMARY METAL INDUSTRIES	3	1	19	5	1	*	1
	34	FABRICATED METAL PRODUCTS	17	5	600	53	111	29	90
	35	MACHINERY, EXCEPT ELECTRICAL	30	3	216	33	8	2	6
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	3	1	146	31	5	1	4
	37	TRANSPORTATION EQUIPMENT	7	2	148	84	4	1	3
	38	INSTRUMENTS AND RELATED PRODUCTS	2	1	28	10	*	*	*
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	4	0	38	0	2	*	1
		TOTAL	217	56	13876	5016	49204	12998	39891
47		SUTTER							
	20	FOOD AND KINDRED PRODUCTS	12	6	675	504	1036	273	839
	24	LUMBER AND WOOD PRODUCTS	6	0	319	0	248	65	201
	25	FURNITURE AND FIXTURES	2	0	2	0	*	*	*
	27	PRINTING AND PUBLISHING	2	0	29	0	1	*	1
	28	CHEMICALS AND ALLIED PRODUCTS	1	0	15	0	11	3	9
	32	STONE, CLAY, AND GLASS PRODUCTS	5	0	33	0	61	16	49
	34	FABRICATED METAL PRODUCTS	3	2	70	45	2	*	1
	35	MACHINERY, EXCEPT ELECTRICAL	7	1	51	1	1	*	*
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	2	0	3	0	*	*	*
		TOTAL	40	9	1197	550	1362	359	1104
48		TEHAMA							
	20	FOOD AND KINDRED PRODUCTS	8	2	392	42	434	114	352
	24	LUMBER AND WOOD PRODUCTS	22	2	1965	145	3072	811	2490
	25	FURNITURE AND FIXTURES	1	0	16	0	*	*	*
	26	PAPER AND ALLIED PRODUCTS	1	1	416	400	3284	867	2662
	27	PRINTING AND PUBLISHING	4	2	45	33	1	*	1
		TOTAL	36	7	2834	620	6794	1794	5508

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
49		TRINITY							
	24	LUMBER AND WOOD PRODUCTS	19	2	498	34	2250	594	1824
	27	PRINTING AND PUBLISHING	1	0	E	0	*	*	*
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	1	0	2	0	*	*	*
		TOTAL	21	2	506	34	2250	594	1824
50		TULARE							
	19	ORDNANCE AND ACCESSORIES	1	1	1	1	*	*	*
	20	FOOD AND KINDRED PRODUCTS	46	11	1598	1004	7603	2008	6163
	22	TEXTILE MILL PRODUCTS	1	0	1	0	*	*	*
	23	APPAREL AND OTHER TEXTILE PRODUCTS	4	0	383	0	15	4	12
	24	LUMBER AND WOOD PRODUCTS	22	4	624	157	8231	2174	6673
	25	FURNITURE AND FIXTURES	3	0	24	0	1	*	1
	26	PAPER AND ALLIED PRODUCTS	1	1	100	90	22	5	18
	27	PRINTING AND PUBLISHING	22	6	1204	386	103	27	83
	28	CHEMICALS AND ALLIED PRODUCTS	7	4	100	40	56	14	45
	29	PETROLEUM AND COAL PRODUCTS	1	0	3	0	4	1	3
	30	RUBBER AND PLASTICS PRODUCTS, NEC	2	0	5	0	*	*	*
	32	STONE, CLAY, AND GLASS PRODUCTS	17	1	231	6	85	22	69
	33	PRIMARY METAL INDUSTRIES	5	0	483	0	151	39	122
	34	FABRICATED METAL PRODUCTS	6	2	165	33	12	3	9
	35	MACHINERY, EXCEPT ELECTRICAL	17	5	369	219	38	10	31
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	6	1	79E	258	101	26	82
	37	TRANSPORTATION EQUIPMENT	5	1	254	2	7	1	5
	38	INSTRUMENTS AND RELATED PRODUCTS	3	1	93	2	5	1	4
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	5	1	60	1	16	4	13
		TOTAL	174	39	6494	2199	16458	4347	13343
51		TUOLUMNE							
	20	FOOD AND KINDRED PRODUCTS	2	0	17	0	22	E	18
	24	LUMBER AND WOOD PRODUCTS	18	6	791	94	1250	330	1013
	27	PRINTING AND PUBLISHING	4	0	38	0	2	*	2
	32	STONE, CLAY, AND GLASS PRODUCTS	1	0	28	0	18	5	15
	33	PRIMARY METAL INDUSTRIES	1	1	20	12	*	*	*
	35	MACHINERY, EXCEPT ELECTRICAL	1	0	19	0	*	*	*
		TOTAL	27	7	913	106	1296	342	1050
52		VENTURA							
	19	ORDNANCE AND ACCESSORIES	1	0	3	0	*	*	*
	20	FOOD AND KINDRED PRODUCTS	25	5	1715	650	4369	1154	3542
	23	APPAREL AND OTHER TEXTILE PRODUCTS	16	3	556	110	16	4	13
	24	LUMBER AND WOOD PRODUCTS	8	1	83	43	15	4	12
	25	FURNITURE AND FIXTURES	6	0	71	0	3	*	2
	26	PAPER AND ALLIED PRODUCTS	4	1	603	295	810	214	657
	27	PRINTING AND PUBLISHING	35	3	810	84	49	12	39

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
52		VENTURA (CONTINUED)							
	28	CHEMICALS AND ALLIED PRODUCTS	9	5	329	95	923	243	748
	29	PETROLEUM AND COAL PRODUCTS	7	2	89	147	1436	379	1164
	30	RUBBER AND PLASTICS PRODUCTS, NEC	10	1	720	6	22	5	18
	31	LEATHER AND LEATHER PRODUCTS	1	0	28	0	*	*	*
	32	STONE, CLAY, AND GLASS PRODUCTS	14	0	287	0	247	65	200
	33	PRIMARY METAL INDUSTRIES	6	2	252	109	188	49	152
	34	FABRICATED METAL PRODUCTS	19	5	618	402	217	57	176
	35	MACHINERY, EXCEPT ELECTRICAL	29	8	537	453	31	8	25
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	14	4	2077	685	401	106	325
	37	TRANSPORTATION EQUIPMENT	16	4	3429	1130	342	90	277
	38	INSTRUMENTS AND RELATED PRODUCTS	10	5	633	572	58	15	47
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	13	1	48	1	9	2	7
		TOTAL	243	50	12988	4782	9145	2415	7414
53		YOLO							
	20	FOOD AND KINDRED PRODUCTS	18	4	1761	661	9490	2507	7694
	23	APPAREL AND OTHER TEXTILE PRODUCTS	2	1	4	4	*	*	*
	24	LUMBER AND WOOD PRODUCTS	3	0	202	0	59	15	48
	25	FURNITURE AND FIXTURES	1	0	49	0	1	*	1
	26	PAPER AND ALLIED PRODUCTS	1	0	359	0	32	8	26
	27	PRINTING AND PUBLISHING	7	3	167	73	7	1	5
	28	CHEMICALS AND ALLIED PRODUCTS	9	4	132	115	106	28	86
	32	STONE, CLAY, AND GLASS PRODUCTS	5	1	97	40	109	29	89
	34	FABRICATED METAL PRODUCTS	9	1	146	9	66	17	53
	35	MACHINERY, EXCEPT ELECTRICAL	14	5	135	89	3	*	2
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	1	1	23	23	14	3	12
	37	TRANSPORTATION EQUIPMENT	7	4	302	132	10	2	8
	38	INSTRUMENTS AND RELATED PRODUCTS	2	0	3	0	*	*	*
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	2	0	7	0	*	*	*
		TOTAL	81	24	3387	1146	9903	2616	8029
54		YUBA							
	20	FOOD AND KINDRED PRODUCTS	4	0	51	0	61	16	49
	24	LUMBER AND WOOD PRODUCTS	14	3	523	74	1120	296	908
	27	PRINTING AND PUBLISHING	4	2	92	6	5	1	4
	28	CHEMICALS AND ALLIED PRODUCTS	1	0	6	0	*	*	*
	30	RUBBER AND PLASTICS PRODUCTS, NEC	3	2	186	222	6	1	5
	35	MACHINERY, EXCEPT ELECTRICAL	3	0	8	0	*	*	*
	37	TRANSPORTATION EQUIPMENT	5	1	218	85	20	5	16
		TOTAL	34	8	1084	387	1215	321	985
55		MULTI-COUNTY							
	20	FOOD AND KINDRED PRODUCTS	5	0	256	0	314	83	254
		TOTAL	5	0	256	0	314	83	254

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
59		UNALLOCATED BY COUNTY							
	20	FOOD AND KINDRED PRODUCTS	1	0	2	0	1	*	1
		TOTAL	1	0	2	0	1	*	1
60		LOS ANGELES							
	19	ORDNANCE AND ACCESSORIES	18	3	25035	8770	1402	370	1136
	20	FOOD AND KINDRED PRODUCTS	669	163	49782	13644	47692	12598	38664
	21	TOBACCO MANUFACTURES	3	0	25	0	19	5	15
	22	TEXTILE MILL PRODUCTS	185	39	6679	1764	2567	678	2081
	23	APPAREL AND OTHER TEXTILE PRODUCTS	1625	162	50976	6504	1982	523	1607
	24	LUMBER AND WOOD PRODUCTS	352	64	7028	1439	663	175	537
	25	FURNITURE AND FIXTURES	818	128	25946	5606	2837	749	2300
	26	PAPER AND ALLIED PRODUCTS	247	74	17273	7372	28177	7443	22843
	27	PRINTING AND PUBLISHING	1824	198	40958	7268	2880	760	2335
	28	CHEMICALS AND ALLIED PRODUCTS	602	189	27807	12314	20241	5347	16409
	29	PETROLEUM AND COAL PRODUCTS	80	29	17306	10159	85187	22504	69063
	30	RUBBER AND PLASTICS PRODUCTS, NEC	559	119	25899	9126	5781	1527	4686
	31	LEATHER AND LEATHER PRODUCTS	138	23	5034	1031	678	179	549
	32	STONE, CLAY, AND GLASS PRODUCTS	452	111	22023	6272	13490	3563	10936
	33	PRIMARY METAL INDUSTRIES	432	113	27359	12359	14562	3846	11805
	34	FABRICATED METAL PRODUCTS	1851	365	68641	16710	24228	6400	19642
	35	MACHINERY, EXCEPT ELECTRICAL	2567	397	78035	24922	9512	2513	7712
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	1130	175	104801	23155	9092	2401	7371
	37	TRANSPORTATION EQUIPMENT	923	184	145407	68656	21837	5768	17704
	38	INSTRUMENTS AND RELATED PRODUCTS	391	74	19222	13450	2508	662	2033
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	696	101	20671	2078	1013	267	821
		TOTAL	15562	2711	785907	252599	296353	78288	240259
70		ALAMEDA							
	20	FOOD AND KINDRED PRODUCTS	180	65	15783	5871	19127	5052	15506
	22	TEXTILE MILL PRODUCTS	13	5	194	56	11	2	9
	23	APPAREL AND OTHER TEXTILE PRODUCTS	38	12	910	241	28	7	23
	24	LUMBER AND WOOD PRODUCTS	38	10	774	117	37	9	30
	25	FURNITURE AND FIXTURES	62	24	2011	635	211	55	171
	26	PAPER AND ALLIED PRODUCTS	48	15	3491	1256	2551	674	2068
	27	PRINTING AND PUBLISHING	171	26	4761	1047	288	76	233
	28	CHEMICALS AND ALLIED PRODUCTS	89	38	4643	3114	13491	3564	10937
	29	PETROLEUM AND COAL PRODUCTS	16	2	1442	91	8980	2372	7280
	30	RUBBER AND PLASTICS PRODUCTS, NEC	43	11	1132	423	181	48	147
	31	LEATHER AND LEATHER PRODUCTS	8	2	204	102	115	30	93
	32	STONE, CLAY, AND GLASS PRODUCTS	55	16	4210	2364	2098	554	1701
	33	PRIMARY METAL INDUSTRIES	52	21	6219	2879	6733	1778	5458
	34	FABRICATED METAL PRODUCTS	228	85	12252	5849	2624	693	2127
	35	MACHINERY, EXCEPT ELECTRICAL	277	86	10535	4014	1083	286	878
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	80	27	3885	1006	357	94	289
	37	TRANSPORTATION EQUIPMENT	51	19	7876	7418	5703	1506	4623

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
70		ALAMEDA (CONTINUED)							
	38	INSTRUMENTS AND RELATED PRODUCTS	37	8	673	150	20	5	16
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	55	17	646	186	26	6	21
		TOTAL	1541	489	81641	36819	63672	16820	51620
80		SAN FRANCISCO							
	20	FOOD AND KINDRED PRODUCTS	178	41	9924	2599	11834	3126	9594
	22	TEXTILE MILL PRODUCTS	15	3	394	64	15	4	12
	23	APPAREL AND OTHER TEXTILE PRODUCTS	251	42	8047	1520	254	67	206
	24	LUMBER AND WOOD PRODUCTS	25	7	198	36	15	4	12
	25	FURNITURE AND FIXTURES	60	10	1146	168	532	140	431
	26	PAPER AND ALLIED PRODUCTS	24	3	797	40	153	40	124
	27	PRINTING AND PUBLISHING	366	56	9996	3993	882	233	715
	28	CHEMICALS AND ALLIED PRODUCTS	61	16	1784	289	691	182	560
	29	PETROLEUM AND COAL PRODUCTS	2	0	77	0	98	25	79
	30	RUBBER AND PLASTICS PRODUCTS, NEC	13	4	185	16	8	2	6
	31	LEATHER AND LEATHER PRODUCTS	17	6	271	177	932	246	755
	32	STONE, CLAY, AND GLASS PRODUCTS	20	5	549	29	734	193	595
	33	PRIMARY METAL INDUSTRIES	19	4	678	195	383	101	310
	34	FABRICATED METAL PRODUCTS	113	30	5306	1609	533	140	432
	35	MACHINERY, EXCEPT ELECTRICAL	82	19	1686	179	55	14	44
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	43	8	776	291	74	19	60
	37	TRANSPORTATION EQUIPMENT	26	7	1922	1122	340	89	275
	38	INSTRUMENTS AND RELATED PRODUCTS	28	5	393	46	12	3	9
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	83	13	876	169	45	12	36
		TOTAL	1426	279	45005	12542	17597	4648	14266
90		SAN DIEGO							
	19	ORDNANCE AND ACCESSORIES	2	0	8133	0	710	187	576
	20	FOOD AND KINDRED PRODUCTS	71	7	3711	1430	2523	666	2046
	22	TEXTILE MILL PRODUCTS	1	0	11	0	*	*	*
	23	APPAREL AND OTHER TEXTILE PRODUCTS	39	5	2754	1265	52	13	42
	24	LUMBER AND WOOD PRODUCTS	40	7	466	170	215	56	174
	25	FURNITURE AND FIXTURES	37	9	663	261	903	238	732
	26	PAPER AND ALLIED PRODUCTS	7	1	181	1	184	48	149
	27	PRINTING AND PUBLISHING	177	27	4097	2158	421	111	341
	28	CHEMICALS AND ALLIED PRODUCTS	25	2	847	24	2978	786	2414
	29	PETROLEUM AND COAL PRODUCTS	9	1	84	34	550	145	446
	30	RUBBER AND PLASTICS PRODUCTS, NEC	20	2	354	63	26	7	21
	31	LEATHER AND LEATHER PRODUCTS	7	1	63	2	16	4	13
	32	STONE, CLAY, AND GLASS PRODUCTS	41	15	1180	438	479	126	388
	33	PRIMARY METAL INDUSTRIES	9	3	238	120	86	22	69
	34	FABRICATED METAL PRODUCTS	85	20	1253	354	572	151	463
	35	MACHINERY, EXCEPT ELECTRICAL	125	24	3990	857	295	78	239
	36	ELECTRICAL EQUIPMENT AND SUPPLIES	108	31	8290	2771	488	129	396

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 6 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE BY COUNTY AND MAJOR INDUSTRY GROUP IN 1970

COUNTY CODE	SIC CODE	COUNTY AND MAJOR SIC INDUSTRY GROUP	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER USE		
			TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET
90		SAN DIEGO (CONTINUED)							
	37	TRANSPORTATION EQUIPMENT	101	12	26170	5230	2764	730	2240
	38	INSTRUMENTS AND RELATED PRODUCTS	38	3	653	165	38	10	31
	39	MISCELLANEOUS MANUFACTURING INDUSTRIES	57	4	903	211	51	13	41
		TOTAL	999	174	64041	15554	13361	3529	10831
		ALL COUNTIES TOTAL	29786	5491	1517236	485552	1171404	309453	949677

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 7

ESTIMATED ANNUAL TOTAL FRESH WATER USE AND UNIT EMPLOYEE USE BY INDUSTRY GROUP IN 1970

SIC CODE	MANUFACTURING CLASSIFICATION	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER			EMPLOYEE UNIT USE WORK DAY	
		TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET	LITRES	GALLONS
190	ORDNANCE AND ACCESSORIES	54	9	65228	26085	6140	1622	4978	416	110
191	GUNS, HOWITZERS AND MORTARS	1	0	77	0	58	15	47	3384	894
192	AMMUNITION, EXCEPT FOR SMALL ARMS	29	4	61248	23686	5237	1383	4245	379	100
193	TANKS AND TANK COMPONENTS	1	3	2345	2344	507	134	411	958	253
194	SIGHTING AND FIRE CONTROL EQUIPMENT	1	0	109	0	83	22	67	3384	894
195	SMALL ARMS	11	1	759	54	36	9	29	216	57
196	SMALL ARMS AMMUNITION	6	1	423	1	13	3	10	136	36
199	ORDNANCE AND ACCESSORIES, NEC	5	0	267	0	204	53	165	3384	894
200	FOOD AND KINDRED PRODUCTS	2461	601	166068	57920	317413	83852	257332	8400	2219
201	MEAT PRODUCTS	315	79	18372	6960	20626	5448	16722	4966	1312
202	DAIRY PRODUCTS	278	53	17133	3831	25710	6792	20843	6640	1754
203	CANNED, CURED, AND FROZEN FOODS	508	129	56364	21742	125830	33241	102013	9732	2571
204	GRAIN MILL PRODUCTS	221	59	7280	2495	5425	1433	4398	3286	868
205	BAKERY PRODUCTS	241	42	20159	3714	4231	1117	3430	927	245
206	SUGAR	18	7	3804	2886	49256	13012	39933	54298	14344
207	CONFECTIONERY AND RELATED PRODUCTS	119	28	5254	2282	17343	4581	14060	14415	3808
208	BEVERAGES	332	96	19157	7436	45845	12111	37167	10588	2797
209	MISC. FOODS AND KINDRED PRODUCTS	429	108	18545	6574	23143	6113	18762	5523	1459
210	TOBACCO MANUFACTURES	4	0	45	0	34	9	27	3384	894
211	CIGARETTES	1	0	20	0	15	4	12	3384	894
212	CIGARS	3	0	25	0	19	5	15	3384	894
220	TEXTILE MILL PRODUCTS	252	52	9698	2222	3018	797	2447	1378	364
221	WEAVING MILLS, COTTON	6	0	86	0	65	17	53	3384	894
222	WEAVING MILLS, SYNTHETICS	5	1	43	15	1	*	*	121	32
223	WEAVING AND FINISHING MILLS, WOOL	11	1	580	81	81	21	65	621	164
224	NARROW FABRIC MILLS	13	3	289	17	279	73	226	4281	1131
225	KNITTING MILLS	71	8	2228	388	249	65	202	496	131
226	TEXTILE FINISHING, EXCEPT WOOL	24	3	610	196	642	169	520	4660	1231
227	FLOOR COVERING MILLS	52	13	3593	857	1566	413	1270	1931	510
228	YARN AND THREAD MILLS	8	2	560	10	17	4	14	136	36
229	MISCELLANEOUS TEXTILE GOODS	62	21	1709	658	114	30	92	295	78
230	APPAREL AND OTHER TEXTILE PRODUCTS	2183	250	69828	10399	2560	676	2076	163	43
231	MEN'S AND BOYS' SUITS AND COATS	28	8	3290	1706	55	14	44	76	20
232	MEN'S AND BOYS' FURNISHINGS	186	26	10575	1756	338	89	274	140	37
233	WOMEN'S AND MISSES' OUTERWEAR	1202	127	36839	4112	1100	290	892	132	35
234	WOMEN'S AND CHILDREN'S UNDERGARMENTS	55	7	4045	315	118	31	96	129	34
235	HATS, CAPS, AND MILLINERY	30	1	392	1	12	3	9	136	36
236	CHILDREN'S OUTERWEAR	46	7	1799	349	45	11	36	110	29
237	FUR GOODS	28	2	157	11	4	1	3	136	36
238	MISCELLANEOUS APPAREL AND ACCESSORIES	71	11	1682	309	67	17	54	178	47
239	MISC. FABRICATED TEXTILE PRODUCTS	537	61	11049	1840	817	216	663	329	87
240	LUMBER AND WOOD PRODUCTS	1608	277	46607	13067	83329	22013	67556	7877	2081
241	LOGGING CAMPS, & LOGGING CONTRACTORS	442	40	3616	788	670	177	543	821	217
242	SAWMILLS AND PLANING MILLS	267	71	20274	7763	74492	19678	60392	16258	4295

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 7 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE AND UNIT EMPLOYEE USE BY INDUSTRY GROUP IN 1970

SIC CODE	MANUFACTURING CLASSIFICATION	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER			EMPLOYEE UNIT USE WORK DAY	
		TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET	LITRES	GALLONS
243	MILLWORK, PLYWOOD & RELATED PRODUCTS	423	94	11969	2086	1300	343	1054	481	127
244	WOODEN CONTAINERS	134	14	4069	411	1239	327	1004	1348	356
249	MISCELLANEOUS WOOD PRODUCTS	342	58	6879	2019	5625	1486	4560	3619	956
250	FURNITURE AND FIXTURES	1258	207	34837	7541	4728	1249	3833	602	159
251	HOUSEHOLD FURNITURE	825	131	24086	4550	3863	1020	3132	708	187
252	OFFICE FURNITURE	57	10	2570	709	249	65	202	428	113
253	PUBLIC BUILDING FURNITURE	26	6	1934	944	393	103	319	901	238
254	PARTITIONS AND FIXTURES	253	41	4873	960	152	40	123	140	37
259	MISCELLANEOUS FURNITURE AND FIXTURES	97	19	1374	378	69	18	55	223	59
260	PAPER AND ALLIED PRODUCTS	470	156	35692	16651	210645	55646	170773	25964	6859
261	PULP MILLS	3	1	425	167	84302	22270	68345	877698	231864
262	PAPER MILLS, EXCEPT BUILDING PAPER	9	6	2587	2395	51194	13524	41504	81193	21449
263	PAPERBOARD MILLS	14	6	4078	2579	42250	11161	34253	45845	12111
264	MISC. CONVERTED PAPER PRODUCTS	230	82	13074	5862	21350	5640	17309	7226	1909
265	PAPERBOARD CONTAINERS AND BOXES	207	60	15293	5847	11538	3048	9354	3339	882
266	BUILDING PAPER AND BOARD MILLS	7	1	235	1	7	1	5	136	36
270	PRINTING AND PUBLISHING	3735	455	88216	19598	6491	1715	5263	326	86
271	NEWSPAPERS	501	72	34323	7880	2249	594	1823	291	77
272	PERIODICALS	258	19	3709	746	160	42	130	193	51
273	BOOKS	149	18	2825	461	128	34	104	201	53
274	MISCELLANEOUS PUBLISHING	259	29	4165	448	634	167	514	674	178
275	COMMERCIAL PRINTING	2119	255	30769	7379	2517	665	2041	363	96
276	MANIFOLD BUSINESS FORMS	49	12	4237	1442	187	49	151	197	52
277	GREETING CARD PUBLISHING	24	2	1179	34	39	10	31	148	39
278	BLANKBOOKS AND BOOKBINDING	147	21	4273	848	286	75	231	295	78
279	PRINTING TRADE SERVICES	229	27	2736	360	287	75	233	466	123
280	CHEMICALS AND ALLIED PRODUCTS	1157	383	53422	25154	99123	26185	80360	8176	2160
281	INDUSTRIAL CHEMICALS	169	77	11406	6189	61232	16175	49641	23318	6160
282	PLASTICS MATERIALS AND SYNTHETICS	86	41	4558	2422	3471	917	2814	3369	890
283	DRUGS	140	36	8078	3678	2446	646	1983	1340	354
284	SOAP, CLEANERS, AND TOILET GOODS	271	81	9871	4420	7826	2067	6345	3509	927
285	PAINTS AND ALLIED PRODUCTS	204	66	7492	3114	1936	511	1570	1143	302
286	GUM AND WOOD CHEMICALS	4	1	58	25	39	10	32	3013	796
287	AGRICULTURAL CHEMICALS	98	34	4899	1501	16846	4450	13657	15217	4020
289	MISCELLANEOUS CHEMICAL PRODUCTS	185	47	7060	3805	5322	1406	4315	3335	881
290	PETROLEUM AND COAL PRODUCTS	230	54	29622	15543	208360	55043	168921	31124	8222
291	PETROLEUM REFINING	135	31	25414	13540	201203	53152	163118	35030	9254
295	PAVING AND ROOFING MATERIALS	56	12	3041	1347	6662	1759	5401	9694	2561
299	MISC. PETROLEUM AND COAL PRODUCTS	39	11	1167	656	495	130	401	1878	496
300	RUBBER AND PLASTICS PRODUCTS, NEC	961	198	41448	12856	8710	2301	7061	931	246
301	TIRES AND INNER TUBES	26	9	7704	4910	5041	1331	4087	2896	765
302	RUBBER FOOTWEAR	2	0	186	0	142	37	115	3384	894
303	RECLAIMED RUBBER	3	0	39	0	29	7	24	3384	894
306	FABRICATED RUBBER PRODUCTS, NEC	145	20	7399	1180	472	124	382	284	75
307	MISCELLANEOUS PLASTICS PRODUCTS	785	169	26120	6766	3024	799	2452	511	135

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 7 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE AND UNIT EMPLOYEE USE BY INDUSTRY GROUP IN 1970

SIC CODE	MANUFACTURING CLASSIFICATION	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER			EMPLOYEE UNIT USE WORK DAY	
		TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET	LITRES	GALLONS
310	LEATHER AND LEATHER PRODUCTS	205	38	6382	1631	3428	905	2779	2377	628
311	LEATHER TANNING AND FINISHING	18	4	782	509	3237	855	2624	18318	4839
312	INDUSTRIAL LEATHER BELTING	7	1	120	16	3	*	2	114	30
313	FOOTWEAR CUT STOCK	9	2	173	82	5	1	4	136	36
314	FOOTWEAR, EXCEPT RUBBER	50	8	2999	599	91	24	74	136	36
315	LEATHER GLOVES AND MITTENS	9	1	180	25	5	1	4	136	36
316	LUGGAGE	27	7	720	229	26	6	21	163	43
317	HANDBAGS AND PERSONAL LEATHER GOODS	50	7	852	78	42	11	34	220	58
319	LEATHER GOODS, NEC	35	8	556	93	17	4	14	136	36
320	STONE, CLAY, AND GLASS PRODUCTS	1146	255	50848	15822	57416	15167	46548	4997	1320
321	FLAT GLASS	7	2	1320	321	1777	469	1440	5958	1574
322	GLASS AND GLASSWARE, PRESSED OR BLOWN	61	15	10751	5043	6733	1778	5459	2771	732
323	PRODUCTS OF PURCHASED GLASS	99	16	2078	155	134	35	109	288	76
324	CEMENT, HYDRAULIC	22	5	4187	1046	17739	4686	14381	18745	4952
325	STRUCTURAL CLAY PRODUCTS	61	14	4616	1922	867	229	703	833	220
326	POTTERY AND RELATED PRODUCTS	143	20	4295	1028	659	174	534	678	179
327	CONCRETE, GYPSUM, AND PLASTER PRODUCTS	526	128	15452	4083	17722	4681	14368	5076	1341
328	CUT STONE AND STONE PRODUCTS	38	3	356	52	117	31	95	1465	387
329	MISC. NONMETALLIC MINERAL PRODUCTS	189	52	7793	2172	11663	3081	9455	6621	1749
330	PRIMARY METAL INDUSTRIES	711	193	57789	32981	39123	10335	31718	2824	746
331	BLAST FURNACE AND BASIC STEEL PRODUCTS	103	31	22273	17966	22687	5993	18392	3891	1028
332	IRON AND STEEL FOUNDRIES	106	33	7795	2819	1799	475	1459	1022	270
333	PRIMARY NONFERROUS METALS	10	2	577	44	165	43	134	1272	336
334	SECONDARY NONFERROUS METALS	35	8	1331	439	724	191	587	2408	636
335	NONFERROUS ROLLING AND DRAWING	97	28	14839	8273	11331	2993	9187	3380	893
336	NONFERROUS FOUNDRIES	233	57	6481	1950	440	116	357	303	80
339	MISCELLANEOUS PRIMARY METAL PRODUCTS	127	34	4493	1890	1974	521	1600	1946	514
340	FABRICATED METAL PRODUCTS	3125	645	112285	29859	34093	9006	27639	1344	355
341	METAL CANS	46	20	10805	6466	2664	703	2160	1090	288
342	CUTLERY, HAND TOOLS, AND HARDWARE	279	61	14482	3039	1697	448	1376	519	137
343	PLUMBING AND HEATING, EXCEPT ELECTRIC	106	19	6263	587	576	152	467	409	108
344	FABRICATED STRUCTURAL METAL PRODUCTS	1129	221	33353	7629	4483	1184	3635	594	157
345	SCREW MACHINE PRODUCTS, BOLTS, ETC.	216	42	10274	2909	1874	495	1519	806	213
346	METAL STAMPINGS	230	45	9503	1715	1218	321	987	568	150
347	METAL SERVICES, NEC	701	131	13056	2977	18490	4884	14990	6265	1655
348	MISC. FABRICATED WIRE PRODUCTS	177	49	4397	1332	1356	358	1099	1367	361
349	MISC. FABRICATED METAL PRODUCTS	241	57	10152	3205	1730	457	1403	750	198
350	MACHINERY, EXCEPT ELECTRICAL	4518	750	134694	45226	15937	4210	12921	522	138
351	ENGINES AND TURBINES	30	5	3246	1675	586	155	475	799	211
352	FARM MACHINERY	148	34	3101	848	149	39	121	212	56
353	CONSTRUCTION AND RELATED MACHINERY	267	53	13518	3420	521	137	422	170	45
354	METAL WORKING MACHINERY	792	122	14279	3715	3279	866	2658	1014	268
355	SPECIAL INDUSTY MACHINERY	261	70	8004	2698	942	249	764	522	138
356	GENERAL INDUSTRIAL MACHINERY	377	68	14566	4254	2854	754	2313	867	229
357	OFFICE AND COMPUTING MACHINES	213	45	49258	20725	5701	1506	4622	511	135

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 7 (Continued)

ESTIMATED ANNUAL TOTAL FRESH WATER USE AND UNIT EMPLOYEE USE BY INDUSTRY GROUP IN 1970

SIC CODE	MANUFACTURING CLASSIFICATION	NUMBER OF PLANTS		NUMBER OF EMPLOYEES		FRESH WATER			EMPLOYEE UNIT USE WORK DAY	
		TOTAL	REPORTING	TOTAL	REPORTED	MILLION LITRES	MILLION GALLONS	ACRE FEET	LITRES	GALLONS
358	SERVICE INDUSTRY MACHINES	150	33	6616	3494	904	238	733	606	160
359	MISC. MACHINERY, EXCEPT ELECTRICAL	2280	320	22106	4397	997	263	809	201	53
360	ELECTRICAL EQUIPMENT AND SUPPLIES	2043	361	227010	43456	22581	5965	18306	439	116
361	ELECTRIC TEST + CISTRIBUTING EQUIPMENT	200	43	21388	2552	1051	277	852	216	57
362	ELECTRICAL INDUSTRIAL APPARATUS	150	34	13123	2495	1544	408	1252	522	138
363	HOUSEHOLD APPLIANCES	63	5	6465	1365	1509	398	1223	1033	273
364	ELECTRIC LIGHTING AND WIRING EQUIPMENT	298	46	14021	2234	1522	402	1233	481	127
365	RADIO AND TV RECEIVING EQUIPMENT	199	27	13505	1985	2141	565	1736	700	185
366	COMMUNICATION EQUIPMENT	313	64	99470	19067	6267	1655	5081	280	74
367	ELECTRONIC COMPONENTS AND ACCESSORIES	715	122	54188	12852	7396	1954	5996	606	160
369	MISC. ELECTRICAL EQUIPMENT + SUPPLIES	105	20	4850	906	1147	303	930	1049	277
370	TRANSPORTATION EQUIPMENT	1633	283	221782	89419	36134	9545	29295	719	190
371	MOTOR VEHICLES AND EQUIPMENT	384	76	33485	8453	5036	1330	4083	666	176
372	AIRCRAFT THE PARTS	644	132	160219	68893	24270	6411	19676	670	177
373	SHIP AND BOAT BUILDING AND REPAIRING	285	30	14609	9499	6366	1681	5161	1927	509
374	RAILROAD EQUIPMENT	3	1	179	83	4	1	3	98	26
375	MOTORCYCLES, BICYCLES, AND PARTS	44	6	1116	345	120	31	97	481	127
379	MISCELLANEOUS TRANSPORTATION EQUIPMENT	273	38	12174	2146	335	88	272	121	32
380	INSTRUMENTS AND RELATED PRODUCTS	769	130	33603	15570	3740	988	3032	462	122
381	ENGINEERING + SCIENTIFIC INSTRUMENTS	123	19	2948	4160	596	157	483	500	132
382	MECHANICAL MEASURING + CONTROL DEVICES	154	24	10159	5182	1462	386	1185	636	168
383	OPTICAL INSTRUMENTS AND LENSES	73	13	5222	480	190	50	154	163	43
384	MEDICAL INSTRUMENTS AND SUPPLIES	221	40	7856	2844	779	206	632	439	116
385	OPHTHALMIC GOODS	69	9	1402	266	44	11	35	140	37
386	PHOTOGRAPHIC EQUIPMENT AND SUPPLIES	120	24	5954	2624	664	175	538	492	130
387	WATCHES, CLOCKS, AND WATCHCASES	9	1	62	14	2	*	2	193	51
390	MISCELLANEOUS MANUFACTURING INDUSTRIES	1263	194	31932	4552	4255	1124	3449	591	156
391	JEWELRY, SILVERWARE, AND PLATED WARE	158	24	1700	220	63	16	51	167	44
393	MUSICAL INSTRUMENTS AND PARTS	31	3	1380	200	382	101	310	1226	324
394	TOYS AND SPORTING GOODS	313	40	14184	1383	3011	795	2441	939	248
395	PENS, PENCILS, OFFICE AND ART SUPPLIES	108	27	2907	821	239	63	194	363	96
396	COSTUME JEWELRY AND NOTIONS	112	14	1541	140	54	14	43	155	41
399	MISCELLANEOUS MANUFACTURES	541	86	10220	1788	503	132	408	220	58
	TOTAL	29786	5491	1517236	485552	1167269	308360	946324	3404	899

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 8

POTENTIAL ACCEPTANCE OF RECLAIMED WATER BY INDUSTRY GROUP IN 1970

(MILLION GALLONS)

1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	TOTAL NO. OF PLANTS	PLANTS REPORTING ON ACCEPTANCE				
			RESPONDING			TOTAL INTAKE	ACCEPTANCE AS RECLAIMED INTAKE
			TOTAL	NO	YES		
190	ORDNANCE AND ACCESSORIES	54	8	3	5	706	374
191	GUNS, HOWITZERS AND MORTARS	1					
192	AMMUNITION, EXCEPT FOR SMALL ARMS	29	4	2	2	571	250
193	TANKS AND TANK COMPONENTS	1	3	0	3	133	124
194	SIGHTING AND FIRE CONTROL EQUIPMENT	1					
195	SMALL ARMS	11	1	1	0	*	0
196	SMALL ARMS AMMUNITION	6					
199	ORDNANCE AND ACCESSORIES, NEC	5					
200	FOOD AND KINDRED PRODUCTS	2461	509	252	257	43240	27274
201	MEAT PRODUCTS	315	68	44	24	1961	578
202	DAIRY PRODUCTS	278	44	25	19	2421	910
203	CANNED, CURED, AND FROZEN FOODS	508	119	46	73	14934	9316
204	GRAIN MILL PRODUCTS	221	48	23	25	524	395
205	BAKERY PRODUCTS	241	33	23	10	265	66
206	SUGAR	18	7	2	5	14737	11549
207	CONFECTIONERY AND RELATED PRODUCTS	119	24	11	13	2226	1637
208	BEVERAGES	332	82	38	44	4301	1830
209	MISC. FOODS AND KINDRED PRODUCTS	429	84	40	44	1867	988
210	TOBACCO MANUFACTURES	4					
211	CIGARETTES	1					
212	CIGARS	3					
220	TEXTILE MILL PRODUCTS	252	30	15	15	203	111
221	WEAVING MILLS, COTTON	6					
222	WEAVING MILLS, SYNTHETICS	5	1	0	1	*	*
223	WEAVING AND FINISHING MILLS, WOOL	11	1	0	1	3	*
224	NARROW FABRIC MILLS	13	2	1	1	4	*
225	KNITTING MILLS	71	4	4	0	22	0
226	TEXTILE FINISHING, EXCEPT WOOL	24	3	1	2	60	17
227	FLOOR COVERING MILLS	52	9	6	3	101	82
228	YARN AND THREAD MILLS	8					
229	MISCELLANEOUS TEXTILE GOODS	62	10	3	7	11	10
230	APPAREL AND OTHER TEXTILE PRODUCTS	2183	60	44	16	46	7
231	MEN'S AND BOYS' SUITS AND COATS	28	2	1	1	6	*
232	MEN'S AND BOYS' FURNISHINGS	186	7	3	4	8	4
233	WOMEN'S AND MISSES' OUTERWEAR	1202	29	22	7	7	1
234	WOMEN'S AND CHILDREN'S UNDERGARMENTS	55	2	2	0	*	0
235	HATS, CAPS, AND MILLINERY	30					
236	CHILDREN'S OUTERWEAR	46	2	1	1	*	*
237	FUR GOODS	28					
238	MISCELLANEOUS APPAREL AND ACCESSORIES	71	2	2	0		0
239	MISC. FABRICATED TEXTILE PRODUCTS	537	16	13	3	21	*
240	LUMBER AND WOOD PRODUCTS	1608	114	60	54	6458	3764
241	LOGGING CAMPS, + LOGGING CONTRACTORS	442	9	4	5	37	26

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1

TABLE 8 (Continued)

POTENTIAL ACCEPTANCE OF RECLAIMED WATER BY INDUSTRY GROUP IN 1970

(MILLION GALLONS)

1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	TOTAL NO. OF PLANTS	PLANTS REPORTING ON ACCEPTANCE				
			RESPONDING			TOTAL INTAKE	ACCEPTANCE AS RECLAIMED INTAKE
			TOTAL	NO	YES		
242	SAWMILLS AND PLANING MILLS	267	49	14	35	5361	3010
243	MILLWORK, PLYWOOD & RELATED PRODUCTS	423	28	22	6	45	17
244	WOODEN CONTAINERS	134	6	6	0	33	0
249	MISCELLANEOUS WOOD PRODUCTS	342	22	14	8	980	710
250	FURNITURE AND FIXTURES	1258	76	54	22	342	40
251	HOUSEHOLD FURNITURE	825	46	35	11	263	14
252	OFFICE FURNITURE	57	6	3	3	20	7
253	PUBLIC BUILDING FURNITURE	26	2	0	2	51	17
254	PARTITIONS AND FIXTURES	253	13	10	3	4	*
259	MISCELLANEOUS FURNITURE AND FIXTURES	97	9	6	3	2	*
260	PAPER AND ALLIED PRODUCTS	470	100	31	69	47198	35037
261	PULP MILLS	3	1	0	1	8751	8751
262	PAPER MILLS, EXCEPT BUILDING PAPER	9	5	0	5	6978	4509
263	PAPERBOARD MILLS	14	5	1	4	26926	19530
264	MISC. CONVERTED PAPER PRODUCTS	230	53	20	33	1239	1067
265	PAPERBOARD CONTAINERS AND BOXES	207	36	10	26	1304	1179
266	BUILDING PAPER AND BOARD MILLS	7					
270	PRINTING AND PUBLISHING	3735	179	116	63	296	94
271	NEWSPAPERS	501	34	24	10	89	29
272	PERIODICALS	258	3	3	0	1	0
273	BOOKS	149	5	4	1	11	*
274	MISCELLANEOUS PUBLISHING	259	5	3	2	17	11
275	COMMERCIAL PRINTING	2119	105	68	37	147	44
276	MANIFOLD BUSINESS FORMS	49	10	2	8	11	6
277	GREETING CARD PUBLISHING	24					
278	BLANKBOOKS AND BOOKBINDING	147	8	6	2	13	*
279	PRINTING TRADE SERVICES	229	9	6	3	4	1
280	CHEMICALS AND ALLIED PRODUCTS	1157	289	90	199	32333	23706
281	INDUSTRIAL CHEMICALS	169	70	13	57	26719	21300
282	PLASTICS MATERIALS AND SYNTHETICS	86	32	6	26	500	339
283	DRUGS	140	26	16	10	310	70
284	SOAP, CLEANERS, AND TOILET GOODS	271	55	15	40	2395	1197
285	PAINTS AND ALLIED PRODUCTS	204	42	13	29	241	163
286	GUM AND WOOD CHEMICALS	4	1	0	1	4	4
287	AGRICULTURAL CHEMICALS	98	28	14	14	1745	323
289	MISCELLANEOUS CHEMICAL PRODUCTS	185	35	13	22	415	309
290	PETROLEUM AND COAL PRODUCTS	230	46	7	39	98663	36918
291	PETROLEUM REFINING	135	30	4	26	98344	36698
295	PAVING AND ROOFING MATERIALS	56	9	1	8	246	157
299	MISC. PETROLEUM AND COAL PRODUCTS	39	7	2	5	72	62
300	RUBBER AND PLASTICS PRODUCTS, NEC	961	123	42	81	1008	851
301	TIRES AND INNER TUBES	26	8	0	8	798	731
302	RUBBER FOOTWEAR	2					

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 8 (Continued)

POTENTIAL ACCEPTANCE OF RECLAIMED WATER BY INDUSTRY GROUP IN 1970

(MILLION GALLONS)

1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	TOTAL NO. OF PLANTS	PLANTS REPORTING ON ACCEPTANCE				
			RESPONDING			TOTAL INTAKE	ACCEPTANCE AS RECLAIMED INTAKE
			TOTAL	NO	YES		
303	RECLAIMED RUBBER	3					
306	FABRICATED RUBBER PRODUCTS, NEC	145	13	7	6	13	3
307	MISCELLANEOUS PLASTICS PRODUCTS	785	102	35	67	196	116
310	LEATHER AND LEATHER PRODUCTS	205	7	2	5	548	159
311	LEATHER TANNING AND FINISHING	18	4	1	3	546	156
312	INDUSTRIAL LEATHER BELTING	7	1	0	1	*	*
313	FOOTWEAR CUT STOCK	9					
314	FOOTWEAR, EXCEPT RUBBER	50					
315	LEATHER GLOVES AND MITTENS	9					
316	LUGGAGE	27					
317	HANDBAGS AND PERSONAL LEATHER GOODS	50	2	1	1	2	2
319	LEATHER GOODS, NEC	35					
320	STONE, CLAY, AND GLASS PRODUCTS	1146	179	61	118	3975	2667
321	FLAT GLASS	7	2	0	2	110	110
322	GLASS AND GLASSWARE, PRESSED OR BLOWN	61	12	2	10	717	431
323	PRODUCTS OF PURCHASED GLASS	99	10	9	1	2	*
324	CEMENT, HYDRAULIC	22	4	0	4	979	976
325	STRUCTURAL CLAY PRODUCTS	61	8	2	6	93	43
326	POTTERY AND RELATED PRODUCTS	143	12	2	10	50	7
327	CONCRETE, GYPSUM, AND PLASTER PRODUCTS	526	101	34	67	1318	782
328	CUT STONE AND STONE PRODUCTS	38	2	0	2	4	3
329	MISC. NONMETALLIC MINERAL PRODUCTS	189	28	12	16	698	312
330	PRIMARY METAL INDUSTRIES	711	144	45	99	6966	3028
331	BLAST FURNACE AND BASIC STEEL PRODUCTS	103	25	5	20	4627	1449
332	IRON AND STEEL FOUNDRIES	106	27	6	21	182	105
333	PRIMARY NONFERROUS METALS	10	2	1	1	40	40
334	SECONDARY NONFERROUS METALS	35	7	0	7	69	61
335	NONFERROUS ROLLING AND DRAWING	97	17	5	12	1841	1252
336	NONFERROUS FOUNDRIES	233	38	20	18	22	9
339	MISCELLANEOUS PRIMARY METAL PRODUCTS	127	28	8	20	183	109
340	FABRICATED METAL PRODUCTS	3125	327	184	143	2273	1520
341	METAL CANS	46	14	4	10	448	378
342	CUTLERY, HAND TOOLS, AND HARDWARE	279	28	21	7	89	44
343	PLUMBING AND HEATING, EXCEPT ELECTRIC	106	13	6	7	19	9
344	FABRICATED STRUCTURAL METAL PRODUCTS	1129	94	60	34	381	256
345	SCREW MACHINE PRODUCTS, BOLTS, ETC.	216	22	16	6	148	115
346	METAL STAMPINGS	230	19	12	7	54	31
347	METAL SERVICES, NEC	701	82	35	47	972	575
348	MISC. FABRICATED WIRE PRODUCTS	177	19	13	6	35	19
349	MISC. FABRICATED METAL PRODUCTS	241	36	17	19	122	89
350	MACHINERY, EXCEPT ELECTRICAL	4518	316	188	128	1532	541
351	ENGINES AND TURBINES	30	2	0	2	73	36
352	FARM MACHINERY	148	17	8	9	16	5

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1

TABLE 8 (Continued)

POTENTIAL ACCEPTANCE OF RECLAIMED WATER BY INDUSTRY GROUP IN 1970

(MILLION GALLONS)

1 MILLION GALLONS = 3785.4 CUBIC METRES

SIC CODE	INDUSTRY GROUP	TOTAL NO. OF PLANTS	PLANTS REPORTING ON ACCEPTANCE				
			RESPONDING			TOTAL INTAKE	ACCEPTANCE AS RECLAIMED INTAKE
			TOTAL	NO	YES		
353	CONSTRUCTION AND RELATED MACHINERY	267	29	19	10	27	9
354	METAL WORKING MACHINERY	792	45	26	19	215	172
355	SPECIAL INDUSTY MACHINERY	261	34	17	17	108	47
356	GENERAL INDUSTRIAL MACHINERY	377	35	23	12	255	28
357	OFFICE AND COMPUTING MACHINES	213	24	9	15	637	120
358	SERVICE INDUSTRY MACHINES	150	15	6	9	152	95
359	MISC. MACHINERY, EXCEPT ELECTRICAL	2280	115	80	35	45	25
360	ELECTRICAL EQUIPMENT AND SUPPLIES	2043	212	102	110	1434	727
361	ELECTRIC TEST + DISTRIBUTING EQUIPMENT	200	23	11	12	33	19
362	ELECTRICAL INDUSTRIAL APPARATUS	150	19	11	8	188	148
363	HOUSEHOLD APPLIANCES	63	4	3	1	197	9
364	ELECTRIC LIGHTING AND WIRING EQUIPMENT	298	27	13	14	62	38
365	RADIO AND TV RECEIVING EQUIPMENT	199	10	6	4	102	73
366	COMMUNICATION EQUIPMENT	313	39	23	16	288	62
367	ELECTRONIC COMPONENTS AND ACCESSORIES	715	78	30	48	499	341
369	MISC. ELECTRICAL EQUIPMENT + SUPPLIES	105	12	5	7	62	33
370	TRANSPORTATION EQUIPMENT	1633	158	73	85	4832	2269
371	MOTOR VEHICLES AND EQUIPMENT	384	36	20	16	375	197
372	AIRCRAFT THE PARTS	644	78	27	51	2648	1550
373	SHIP AND BOAT BUILDING AND REPAIRING	285	20	7	13	1787	511
374	RAILROAD EQUIPMENT	3					
375	MOTORCYCLES, BICYCLES, AND PARTS	44	4	3	1	11	8
379	MISCELLANEOUS TRANSPORTATION EQUIPMENT	273	20	16	4	9	1
380	INSTRUMENTS AND RELATED PRODUCTS	769	67	34	33	512	397
381	ENGINEERING + SCIENTIFIC INSTRUMENTS	123	11	5	6	96	88
382	MECHANICAL MEASURING + CONTROL DEVICES	154	18	9	9	288	233
383	OPTICAL INSTRUMENTS AND LENSES	73	5	2	3	4	1
384	MEDICAL INSTRUMENTS AND SUPPLIES	221	20	11	9	71	36
385	OPHTHALMIC GOODS	69	2	2	0	*	0
386	PHOTOGRAPHIC EQUIPMENT AND SUPPLIES	120	10	4	6	70	37
387	WATCHES, CLOCKS, AND WATCHCASES	9	1	1	0	*	0
390	MISCELLANEOUS MANUFACTURING INDUSTRIES	1263	66	38	28	150	72
391	JEWELRY, SILVERWARE, AND PLATED WARE	158	8	5	3	1	
393	MUSICAL INSTRUMENTS AND PARTS	31	1	1	0	17	0
394	TOYS AND SPORTING GOODS	313	12	4	8	104	59
395	PENS, PENCILS, OFFICE AND ART SUPPLIES	108	9	4	5	11	6
396	COSTUME JEWELRY AND NOTIONS	112	3	2	1	*	*
399	MISCELLANEOUS MANUFACTURES	541	33	22	11	15	5
	MILLION GALLONS TOTAL	29786	3010	1441	1569	252724	139566
	ACRE FEET TOTAL					775583	428313

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 9

REPORTED SOURCES OF WATER BY COUNTY IN 1970

(MILLION GALLONS)

1 MILLION GALLONS = 3785.4 CUBIC METRES

CODE	COUNTY	NUMBER OF PLANTS		WELLS AND SPRINGS	STREAM	LAKE	BRACKISH	PURCHASED	TOTAL
		TOTAL	REPORTING						
1	ALPINE	1							
2	AMADOR	17	6	44	4	0	0	352	401
3	BUTTE	113	23	447	0	0	0	340	788
4	CALAVERAS	22	7	*	*	0	0	263	264
5	COLUSA	16	2	0	0	0	0	*	*
6	CONTRA COSTA	384	116	220	14227	0	59681	20855	94985
7	DEL NORTE	40	8	14	130	0	0	4	149
8	EL DORADO	55	10	0	304	0	0	86	390
9	FRESNO	472	91	2810	0	0	0	573	3383
10	GLENN	28	2	0	0	0	0	*	*
11	HUMBOLDT	223	34	191	723	0	0	8800	9715
12	IMPERIAL	63	6	180	0	0	0	7	187
13	INYO	13							
14	KERN	235	52	2071	0	0	0	118	2189
15	KINGS	46	18	462	0	0	0	46	509
16	LAKE	24	3	*	0	*	0	*	*
17	LASSEN	19	3	*	0	0	0	997	997
18	MADERA	46	6	11	27	0	0	*	39
19	MARIN	165	34	0	0	1	*	34	36
20	MARIPOSA	8	2	0	0	0	0	*	*
21	MENDOCINO	128	29	1286	429	0	0	116	1832
22	MERCED	74	16	325	0	0	0	612	938
23	MODOC	12	3	0	*	*	0	*	*
24	MONO	4	1	0	0	0	0	*	*
25	MONTEREY	150	30	2895	0	0	9937	81	12914
26	NAPA	71	19	13	0	0	0	69	82
27	NEVADA	31	3	0	*	0	0	30	30
28	ORANGE	2045	223	613	0	0	0	2301	2914
29	PLACER	61	4	0	7	0	0	15	22
30	PLUMAS	32	2	0	0	0	0	*	*
31	RIVERSIDE	393	40	249	0	0	0	574	824
32	SACRAMENTO	373	42	3828	0	0	0	286	4114
33	SAN BENITO	21	6	462	0	0	*	13	476
34	SAN BERNARDINO	609	109	2740	0	0	2220	2585	7546
35	SAN JOAQUIN	291	57	2851	0	0	16944	394	20189
36	SAN LUIS OBISPO	59	8	488	0	0	0	*	488
37	SAN MATEO	742	126	24	0	0	1650	1199	2874
38	SANTA BARBARA	238	37	1089	*	0	0	42	1131
39	SANTA CLARA	1339	319	3742	9	0	0	2517	6268
40	SANTA CRUZ	148	37	175	0	0	*	311	487
41	SHASTA	107	14	1099	35	0	0	3984	5118
42	SIERRA	6	1	0	*	0	0	0	*
43	SISKIYOU	79	10	70	553	0	0	9	633
44	SOLANO	82	17	776	57	0	0	29	862
45	SONOMA	294	59	50	0	1	0	9	60
46	STANISLAUS	217	56	4790	0	0	0	666	5456
47	SUTTER	40	9	173	0	0	0	25	198

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

TABLE 9 (Continued)

REPORTED SOURCES OF WATER BY COUNTY IN 1970

(MILLION GALLONS)

1 MILLION GALLONS = 3785.4 CUBIC METRES

CODE	COUNTY	NUMBER OF PLANTS		WELLS AND SPRINGS	STREAM	LAKE	BRACKISH	PURCHASED	TOTAL
		TOTAL	REPORTING						
48	TEHAMA	36	7	842	129	0	0	10	983
49	TRINITY	21	2	12	39	0	0	1	53
50	TULARE	174	39	985	602	0	0	252	1840
51	TUOLUMNE	27	7	0	1	0	0	61	62
52	VENTURA	243	50	260	0	0	35	919	1215
53	YOLO	81	24	1325	0	0	0	44	1370
54	YUBA	34	8	*	*	0	0	4	5
55	MULTI-COUNTY	5							
59	UNALLOCATED BY COUNTY	1							
60	LOS ANGELES	15562	2709	7748	*	0	27230	26009	60987
70	ALAMEDA	1541	489	1738	0	0	583	4759	7081
80	SAN FRANCISCO	1426	279		0	0	46	835	882
90	SAN DIEGO	999	174	18	82	0	667	756	1525
	MILLION GALLONS TOTAL	29786	5488	47134	17369	2	118996	82014	265518
	ACRE FEET TOTAL			144649	53305	8	365187	251693	814846

* indicates quantity between 0 and 1.

NOTE: Totals include quantities between 0 and 1.

An important part of the water reprocessing and recirculating systems at Kaiser Steel Corporation's Fontana plant are these four circular clarifiers, which remove syspended solids from industrial water. Due to extensive reuse and recirculation of process water, Kaiser Steel uses only 4 cubic metres (1,100 gallons) of water per ton of steel produced, compared with the steel industry average of 150 to 190 cubic metres (40,000 to 50,000 gallons) of water per ton produced. *Photo courtesy of Kaiser Industries*

Chapter V. INDUSTRIAL MANUFACTURING WATER CONSERVATION

Industrial unit water intake is expected to decline substantially over the next decade because of (1) governmental regulations on waste water discharges and (2) possible increases in the price of water to industry.

The Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500) impose strict restraints on the discharge of industrial wastes. The Act stipulates that as a national goal, the discharge of pollutants into navigable waters must be eliminated by 1985. Stated in Section 204 (2) is a requirement to recover federal, State, and local funds contributed to the construction of public sewage facilities where industrial wastes are collected and treated. Industries using the public facilities must repay all costs properly allocated to industrial function, based on the volume and character of the discharge. The Act requires industry to implement the best practicable waste treatment technology by July 1, 1977 and the best available technology economically achievable by July 1, 1983.

These stringent treatment requirements for waste disposal will provide incentives to industry to reduce unit water intake by either reusing waste water or changing certain production processes, or both. Some California industries have already made such changes because of the strict waste discharge requirements imposed by the Porter-Cologne Water Quality Control Act of 1969.

It has been a common practice to favor industry by a pricing policy that reduces the unit cost of block volumes of water for large-quantity deliveries. Due to the increasing costs of water development and the high cost of energy required for delivery, it is anticipated that pricing schedules of many water agencies will be modified to eliminate decreasing block rates (i.e., the larger volume used, the lower the unit volume price) in favor of uniform rates, or increasing block rates.

Although "once-through" water use for cooling and processing is fast being eliminated, there is still considerable opportunity for reducing water demands. Evidence of reductions in water demands, brought about by changes in operations or special plant designs, are numerous throughout the State. Some examples are provided in the following paragraphs.

Steel production requires unusually high quantities of water, as is demonstrated by various plants throughout the nation, but a major California steel producer has nearly approached the theoretical limit in treating and reusing its somewhat limited water supply. Normally, a fully integrated steel plant uses 150 to 190 cubic metres of water (40,000 to 50,000 gallons) per ton of steel. Kaiser Steel, located at Fontana in Southern California, has reduced this figure to 4 cubic metres (1,100 gallons) as a result of the short water supply in this arid region, and the wastewater control standards for discharge of plant effluent.

More than 40 paper plants operate in California, producing 6 100 tonnes (6,700 tons) of paper and paper products each day. Four paper mills use waste wood from lumber and plywood plants, and one of these mills is also using recycled wood derived from dunnage lumber and pallets. The rest of the mills produce paper from recycled waste paper and wood fines.

Most paper mills operate continuously. Process water use by all paper mills currently exceeds 435 000 cubic metres (115 million gallons) a day. The four paper mills referred to in the preceding paragraph produce paper pulp by a chemical process and have a daily process water requirements of about 265 000 cubic metres (70 million gallons).

Technological changes have contributed greatly to the recycling of process water. Today, water recycling or reuse is being practiced in all paper mills. Industry sources indicates that further improvements in water reuse can be expected as the technology of water pollution control advances.

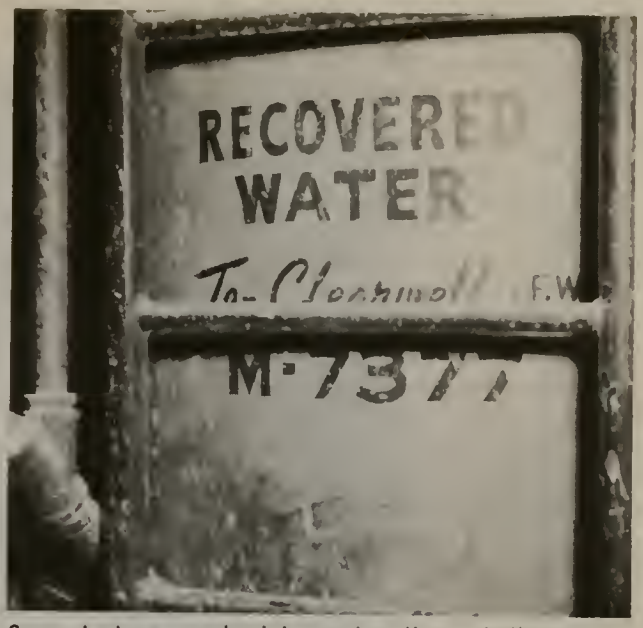
Almost all of the lumber and lumber products produced in California originate in the northern part of the State. In prior years, the industry accounted for the highest rate of use per employee among the manufacturers of the State, primarily because of the large quantities of water used in mill ponds to store and protect logs. In most cases, however, this water was diverted from local streams and then returned, with only small consumptive losses, after once-through use.

The use of mill ponds for storage and quality control is now being supplanted with sprinkled log decks. In this method, logs are stacked in long rows, perhaps 7 to 9 metres (20 to 30 feet) high, and as long as 275 metres (900 feet). Sprinkler pipe is laid along the top of the log decks as shown in the following photograph. The decks are continuously wetted by the sprinkler applications, and the return flows are often recirculated from catchment basins and sumps in a continuous cycle.

The petroleum industry has traditionally used large quantities of water in its refining process. Although water use varies widely among refining plants, an average of 6 litres (1.6 gallons) of water is required to refine 4 litres (1 gallon) of crude oil. The Western Oil and Gas Association queried 20 California refineries and found that all 20 use and reuse water about five times, largely for cooling and boiler feed. In terms of water discharged per barrel of crude oil processed: for cracking plants, the range is about 38 to 190 litres (10 to 50 gallons); for lubrication-oil plants, about 76 to 304 litres (20 to 80 gallons); and petrochemical plants, about 56 to 225 litres (15 to 60 gallons).

Mill ponds (left) are used less frequently for storage and preservation of logs. The practice today is to stack logs in sprinkled decks (right), which requires considerably less water.

Processing poultry requires large quantities of water



Some plants are emphasizing reclamation and other water-saving techniques

Each chemical plant has its own unique water requirements, and water uses are extremely varied. Although the actual water consumption for the industry is relatively small, the gross water use required by a chemical plant may be very large, depending on the products made and the processes used.

The trend in the chemical industry is to use less water in each manufacturing unit. As in other heavy industry, this is being accomplished by the use of cooling towers, which enable a continuous reuse of cooling water. In addition, many manufacturers are modernizing or constructing new plants that use less water and produce less waste. As in other industries, a possible disadvantage is that increasing amounts of energy may be required for waste water treatment and reuse. Because of the current strict regulations governing waste discharges, major improvements are being made in waste water treatment by the chemical industry.

In California, the fruit and vegetable processing industry provides a large portion of the nation's food. Natural and uncontrollable variations in the generation of wastes from this processing are characteristic of the industry. Many of the plants are major water users -- and waste generators. Raw foods must be clean and wholesome for human consumption, and food processing plants must be sanitary at all times, therefore, relatively large volumes of clean water are used -- and are now frequently reused -- prior to discharge.

The food industry was more seriously affected by pollution control requirements than were most others. The result was an effort by the industry to itensify its efforts to develop the necessary equipment and technology to use less water and thus produce less waste water. The effect of this effort to reduce water use has been the generation of liquid wastes, which are much smaller in volume but higher in organic content.

Nationally, the industry reuses 73 percent of its water -- 680 cubic hectometres (550,000 acre-feet) -- in an effort to conserve and reduce waste discharge. The quantities of water reused vary considerably from plant to plant and among plant sizes. The range is from about 30 percent of the water intake to more than 70 percent in the largest plants.

Examples of California industries that have taken action to reduce water intake are as follows:

In 1972, a paperboard plant began a conservation program by installing water clarifiers to allow better reuse of well water. Water use was reduced from 15.0 cubic metres (3,960 gallons) per ton of paper products to 11.1 cubic metres (2,920 gallons) per ton of product; a 26 percent reduction. The cost of developing this process was $54,000, which went toward capital equipment, mechanical changes, and experimentation.

A plant preparing animal by-products drastically reduced plant wash-down water use in less than two years. They changed from use of fresh water to recycled waste water, saving 7 693 cubic metres (2.1 million gallons) at plant No. 1, and 3 661 cubic metres (0.97 million gallons) at plant No. 2. Total use at plant No. 1 was 28 020 cubic metres (7.4 million gallons), which was reduced to 20 057 cubic metres (5.3 million gallons), or more than 28 percent. Use at plant No. 2 was 11 429 metres (3.0 million gallons), which was reduced to 7 767 cubic metres (2.1 million gallons) -- a reduction of 32 percent. The company indicated that the program is effective and is actively promoting conservation.

At another plant, bulk unloaders were installed to reuse conveying and rinse waters. Solid materials are being extracted from lye peeling and diverted to the bulk pack. Screening facilities were enlarged from three screens, with a single passover, to a twelve-screen system with all flow being screened twice in an effort to remove as many solids as possible. A program to reduce water use was instituted during the 1974 season and has been followed stringently since then.

Final effluent from paper manufacturing process is piped to adjacent fields for irrigation of crops. Although no longer suitable for manufacturing, the effluent is of adequate quality for irrigation.

Bleached pulp is recovered and water is saved for recycling in the manufacture of paper

One plant completely stopped the manufacture of potato chips and corn chips in an effort to reduce wastewater flow. This resulted in a greater than 50 percent reduction in wastewater volume. The only significant wastewater flow now being discharged from the plant is created by the defrosting of the fast-freeze units.

A tomato-processing plant installed extractors to remove pulp for sauce, paste, and catsup to reduce loss of pulp into wastewater. Then, bulk unloaders were installed to handle the raw product. These unloading systems reuse wastewater from primary rinse and conveyor water in a reuse cycle, thus reducing discharge from the plant by approximately 10 to 15 percent.

A chemical plant in Southern California expects to drastically reduce sewered effluent in 1976 by recycling direct-contact process water.

A paper container plant in Southern California, which had a high rate of recirculation, took further steps: For one machine, eight showers with fan spray nozzles and a fine mesh screen were installed. Water already used for processing is traversed across the screen to remove as many paper fibers and fines as possible; then, the water flowing through the showers is used to clean the cylinders on the paper machine. This modification eliminated the need for eight needlepoint showers using fresh water, with a savings of 284 litres (75 gallons) per minute. It also reduced the need to pump fresh water from their local wells.

One electroplating plant offered the following information: "We used 186 million gallons of water (704 084 cubic metres) in the 1972-1973 fiscal year but reduced the requirements to 70 million gallons (264 978 cubic metres) 2 years later."

The implementation of this program involved several steps: First, the minimum water required for effective rinsing was determined, and flow-control devices were installed on intake water lines; slightly contaminated water from air scrubbers is now used for preliminary rinsing. Then, counterflows were installed so that water used for rinsing acid from the work can be used to rinse alkaline cleaner before entering the acid tank. Flow changes were made so the maximum use can be made of water before it is sewered or treated. Finally, strict controls have been placed on all operations to prevent uncontrolled and random rinsing with hoses.

The company is also conducting instructional and educational training to convince those responsible for water use that conservation of water in the factory is necessary and important.

Almost all plants contacted indicated an awareness of the need for conservation of water and a probable trend in this direction. Simple steps are being taken first, such as turning off hoses and reducing excess washing of floors and equipment. These first steps are being followed by installation of simple equipment to filter and recycle process and cooling water where heavy treatment is unnecessary. And, most manufacturers are constantly seeking new ideas for water conservation.

Washing lower extremeties of cows before milking. Water is gathered in the channel (foreground) and reused to irrigate alfalfa.

APPENDIX A

References

References

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   Ronald J. Bergland - John Carollo Engineers - Walnut Creek California

   R. W. Birch - B. F. Goodrich Chemical Company

   Hans Buehler - Container Corporation of America

   R. S. Cramer - Standard Oil Company of California - Petroleum Refining Industry

   William K. Ferry - Brown Caldwell - Pasadena, California

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APPENDIX B

Survey Questionnaires Forms

(The form shown was sent to groups of industries with potentially high water requirements. A similar but less-detailed form was sent to small manufacturers with expected lower water requirements.)

INDUSTRIAL WATER USE SURVEY
(for the calendar year 1970)

DATE: _____

NAME OF COMPANY _____

_____

STREET ADDRESS _____

CITY, STATE, ZIP _____

COUNTY _____

CONFIDENTIAL

Data furnished in this report will be treated in strict confidence and will only be published in combination with industry totals.

(2 □)

ACCOUNT NUMBER ASSIGNED BY THE CALIFORNIA DEPARTMENT OF HUMAN RESOURCES DEVELOPMENT *(this number is shown on your address mailing slip included with this material)* _____

MAJOR STANDARD INDUSTRIAL CLASSIFICATION CODE _____ | | | |

Item I: INTAKE WATER (new, or makeup water – annual use)

REPORTED IN: _____ GALLONS ☐ 1
(or) _____ ACRE FEET ☐ 2 *(Specify which)*

	SELF PRODUCED				PURCHASED (PUBLIC AGENCY)	
	FRESH		BRACKISH		FRESH ONLY	
A. PROCESSING	11		21		31	
B. COOLING & CONDENSING	12		22		32	
C. BOILER FEED	13		23		33	
D. EMPLOYEE/SANITARY-ETC	14		24		34	
E. AIR CONDITIONING	15		25		35	
F. OTHER	16		26		36	
G. TOTAL	17		27		37	

(3 □)

Item II: SOURCE OF WATER

A. WELLS AND SPRINGS _____ %
B. STREAM _____ %
C. LAKE _____ %
D. PURCHASED _____ %
E. RECLAIMED _____ %

(Please insure total percent equals 100)

F. NAME OF PUBLIC AGENCY FROM WHICH WATER WAS PURCHASED *(if any)*:

_____

G. DO YOU TREAT WATER BEFORE USE? YES ☐ 1 NO ☐ 2
H. IF YES, WHAT PERCENT? _____ %
I. FOR WHAT PURPOSES? *(Please use letters A. to F. to answer this question. Refer to Item I above for letters)* _____

Item III: WATER RECIRCULATED (Fresh water recirculated within the plant only)

A. WAS ANY WATER RECIRCULATED (RECYCLED)? YES ☐ 1 NO ☐ 2
B. IF YES, FOR WHAT USE? *(Please use letters A. to F. to answer this question. Refer to Item I for letters)* _____
C. IF THE ANSWER TO A. WAS YES, HOW MUCH **ADDITIONAL** WATER WOULD HAVE BEEN REQUIRED IF NO WATER HAD BEEN RECIRCULATED?

REPORTED IN: _____ GALLONS ☐ 1
(or) _____ ACRE FEET ☐ 2 *(Specify which)*
ANNUAL AMOUNT CURRENTLY _____
ANNUAL AMOUNT IN 10 YEARS _____

(4 □)

Item IV: FUTURE WATER REQUIREMENTS

IN YOUR BEST JUDGMENT, CONSIDERING WATER CONSERVATION AND RECIRCULATION, ADVANCED TECHNOLOGY AND AUTOMATION, COST OF WATER, STATUTORY REQUIREMENTS IN WATER QUALITY DISCHARGES, AND OTHER MODIFYING INFLUENCES, **WHAT CHANGES IN WATER USE, PER UNIT OF PRODUCTION,** DO YOU EXPECT FOR YOUR PLANT FROM THE PRESENT LEVEL OF USE, OVER THE NEXT 10 YEARS? *(100% would indicate the same level as present)* _____ %

(OVER)

Item V: WATER DISCHARGE

REPORTED IN: ..... GALLONS ☐ 1
(or) ..... ACRE FEET ☐ 2 *(Specify which)*
ANNUAL DISCHARGED AMOUNT _____

Item VI: USE OF RECLAIMED WATER

COULD YOU USE RECLAIMED WATER IN YOUR OPERATION IF IT WERE AVAILABLE AT A COMPARABLE COST AND QUALITY TO YOUR PRESENT SUPPLY? ..... YES ☐ 1 NO ☐ 2

IF YES, WHAT PERCENT? ..... _____ %

Item VII: AREA OF THE PLANT

INDICATE THE SIZE OF AREA OF PROPERTY AT THIS LOCATION *(do not include undeveloped acreage).*

REPORTED IN: ..... ACRES ☐ 1
(or) ..... SQUARE FEET ☐ 2 *(Specify which)*
..... TOTAL AREA _____

Item VIII: PLANT PRODUCTION (at this location)

A. LIST THE MANUFACTURED PRODUCTS IN ORDER OF IMPORTANCE BY VALUE.....

	PRODUCT	% OF PRODUCTION	UNITS OF PRODUCTION*
5 ☐			
5 ☐			
5 ☐			
5 ☐			
5 ☐			

(6 ☐)

B. WHAT IS THE TOTAL WATER COST, EXPRESSED AS A PERCENTAGE OF TOTAL PRODUCTION COST? ..... _____ %

C. WHAT IS THE TOTAL VALUE OF ANNUAL PRODUCTION?* ..... $ _____

D. WHAT IS THE TOTAL VALUE ADDED BY MANUFACTURE?* ..... $ _____

E. IN YOUR JUDGMENT, WHAT CHANGE WOULD BE EXPECTED TO OCCUR IN YOUR LEVEL OF PRODUCTION OVER THE NEXT 10 YEARS? *(Report in percentage change; 100% would indicate the same level of production as present.)* ..... _____ %

* PLEASE REFER TO DEFINITION OF TERMS

Item IX: EMPLOYMENT

INDICATE THE NUMBER OF EMPLOYEES EARNING WAGES DURING PAY PERIODS WHICH INCLUDE THE 12TH OF:

[PLEASE REFER TO YOUR HUMAN RESOURCES DEVELOPMENT (4) QUARTERLY REPORTS OF EMPLOYMENT – (ITEM A, FORM DE 3) FOR 1970]

JAN (1) _____ JUL (7) _____
FEB (2) _____ AUG (8) _____
MAR (3) _____ SEP (9) _____
APR (4) _____ OCT (10) _____
MAY (5) _____ NOV (11) _____
JUN (6) _____ DEC (12) _____

Item X: COMMENTS

PLEASE MAKE ANY ADDITIONAL COMMENTS YOU MAY FEEL WILL BE OF ASSISTANCE TO US IN UNDERSTANDING YOUR PRESENT AND FUTURE WATER NEEDS AND WATER PROBLEMS.

_____

_____

_____

NAME OF RESPONSIBLE COMPANY OFFICIAL TO CONTACT _____

TITLE _____

PHONE _____

1 ACRE FOOT = 43,560 CUBIC FEET OR 325,851 GALLONS
1 CUBIC FOOT = 7.481 GALLONS

APPENDIX C

Definition of Manufacturing

Definition of Manufacturing

The "Standard Industrial Classification Manual"[1/] defines manufacturing as:

". . . . those establishments engaged in the mechanical or chemical transformation of inorganic or organic substances into new products, and usually described as plants, factories, or mills, which characteristically use power driven machines and materials handling equipment. Establishments engaged in assembling component parts of manufactured products are also considered manufacturing if the new product is neither a structure nor other fixed improvement.

"The materials processed by manufacturing establishments include products of agriculture, forestry, fishing, mining, and quarrying. The final product of a manufacturing establishment may be finished in the sense that it is ready for utilization or consumption, or it may be "semifinished" to become a raw material for an establishment engaged in further manufacturing. For example, the product of the copper smelter is the raw material used in electrolytic refineries; refined copper is the raw material used by copper wire mills; and copper wire is the raw material used by certain electrical equipment manufacturers.

"The materials used by manufacturing establishments may be purchased directly from producers, obtained through customary trade channels, or secured without recourse to the market by transferring the product from one establishment to another which is under the same ownership. Manufacturing production is usually carried on for the wholesale market, for interplant transfer, or domestic consumer.

"Printing, publishing, and industries servicing the printing trades are classified as manufacturing industries.

"There are borderline cases between the manufacturing division and the other divisions in the classification system. Specific instances will be found in the descriptions of the individual industries. A few of the more important examples are:

AGRICULTURE, FORESTRY, AND FISHERIES

"Processing on farms is not considered manufacturing if the raw materials are grown on the farm and if the manufacturing activities are on a small scale without the extensive use of paid labor. Other exclusions are custom grist milling, threshing, and cotton ginning.

1/ U. S. Government Printing Office, Washington D.C., 1967.

MINING

"The dressing and beneficiating of ores, and the breaking, washing, and grading of coal are not considered manufacturing.

CONSTRUCTION

"Fabricating operations performed at the site of construction by contractors are not considered manufacturing, but the prefabrication of sheet metal, concrete, and terrazzo products and similar construction materials is included in the manufacturing division.

WHOLESALE AND RETAIL TRADE

"Establishments engaged in the following types of operations are not included in the manufacturing division: assembling, grading, and preparing fruits and vegetables for market; shelling and roasting nuts; and establishments primarily engaged in selling to the general public, products produced on the same premises from which they are sold, such as bakeries, candy stores, ice cream parlors, shade shops and custom tailors."

It should also be noted that steam-generated electricity is not included under Division D.

APPENDIX D

Structure of the Standard Industrial Classification System

STRUCTURE OF THE STANDARD INDUSTRIAL CLASSIFICATION SYSTEM

The Standard Industrial Classification Manual of 1967 describes the method by which the system is structured and how it can be used to satisfy various levels of detail required:

"The structure of the Classification makes it possible to classify establishments by industry on a two-digit, a three-digit, or a four-digit basis, according to the degree of detail in information which may be needed. It permits an agency to select the level of detail considered most appropriate for presentation of its data. Also, it permits an agency to use additional subdivisions in adopting this Classification for its own use, while still retaining comparability with the classification used by other agencies. Furthermore, comparability with the Classification may be maintained on a two-digit basis by combining groups or industries within a major group; similarly, comparability may be maintained on a three-digit basis by combining industries within a three-digit group. All groupings or industry subdivisions should be clearly labeled.

Agencies which use the three-digit code may use a zero temporarily on the third-digit position for coding reports on which available information is inadequate for proper allocation to a specific three-digit group. For example, major group 25 Furniture and Fixtures, is divided into the following groups:

251 Household Furniture
252 Office Furniture
253 Public Building and Related Furniture
254 Partitions, Shelving, Lockers, and Office and Store Fixtures

259 Miscellaneous Furniture and Fixtures

If an establishment is described as engaged in manufacturing furniture, the report should be coded as "250" until sufficient information is obtained to assign the establishment to the appropriate group.

An agency which uses the four-digit code may use a zero temporarily, in the fourth position, to code reports for which the information available is inadequate for proper allocation to a specific industry.

It will be noted that whenever number nine has been used on the third-or-fourth-digit position, it has been assigned to miscellaneous three-digit groups or four-digit industries covering establishments not elsewhere classified. The establishments grouped at the four-digit level as "not elsewhere classified" may not constitute homogeneous groups but are treated as separate industries for purposes of this classification.

APPENDIX E

Definition of Terms

DEFINITIONS

Air Conditioning - Water used as a heat exchange medium in an apparatus for controlling the humidity and temperature of air.

Boiler Feed - Water used for developing steam power, not including water used in the cooling and condensing of steam.

Brackish Water - Water with a mineral content in the general range between fresh water and seawater. Water containing from 1 000 to 10 000 milligrams of dissolved solids per litre. For this survey, brackish water is considered as water containing more than 1 000 milligrams of dissolved solids per litre.

Cooling Water - Industrial water used to remove heat from the material being processed and the processing machinery.

Employee - Each person on the payroll of an operating manufacturing establishment for any duration.

Employee Working Days - The product of the average annual number of employees and working days.

Employment - The total number of employees working at each plant on the 12th day of each month in 1970. Data is from reports of quarterly employment to the Employment Development Department (EDD).

Establishment - An economic unit which produces goods or services -- for example, a farm, a mine, a factory, a store. In most instances, the establishment is at a single physical location, and it is engaged in only one, or predominantly one, type of economic activity for which an industry code is applicable.

Gross Use - Total quantity of water required for all purposes including recycled water.

Process Water - Water used for any purpose other than air conditioning cooling, sanitary, and boiler feed, which is brought into contact with the materials being manufactured or processed. Except for small amounts of water which may be vaporized or may enter a product either as part of a mixture or in chemical combination, process water is eventually discharged, usually containing waste materials from the manufacturing operation. A large portion of this water is often treated and recycled. Process water would also include water used for plant and equipment washing and for transporting the raw materials and products.

Recirculation (or recycling) - The process of recapturing water once used in the manufacturing process and using this source to supply intake requirements. It differs from reclaimed water in that the source originates within the plant.

Reclaimed Water - Water recovered directly from wastes (and put to beneficial use at another location).

Recycle Rate - Frequency with which Intake Water is recycled. It is calculated by dividing Gross Use by Intake.

Sanitary and Drinking - Water used directly for employees, including washing and for personal hygiene. (shown as Employee/Sanitary on the survey questionnaire)

Urban Water Use - The use of water for urban purposes, including, but not limited to, residential, commercial, industrial, municipal, military, and institutional classes. The term is applied in the sense that it is a kind of use rather than a place of use.

Working Day - Any day during which the establishment is operated by some or all employees.

APPENDIX F

Detailed Procedures

DETAILED PROCEDURES

Mailing of the questionnaires and other material was contracted through interagency agreement with the State Department of General Services. The mailing package consisted of an address mailing slip, a letter of transmittal, a definition of terms used in the survey forms, and the questionnaire. Actually, two questionnaires[1/] were circulated, each covering the same points but one considerably simplified for industries in which water was used primarily for drinking and sanitary purposes.

As questionnaires were returned, they were recorded and replies to questions were sent where requested. Editing of the forms was conducted by the three cooperating agencies. A procedure was established whereby forms were checked for identification consisting of name, address, county of operation, special assigned account number for filing purposes, and Standard Industrial Classification Code number. Secondly, units of water measurement were examined for reasonableness. Then, each of the questions answered was examined to see if a logical reply was provided. Where there were questions involving significant factors, companies were contacted by phone. If the editor thought certain pertinent information may have been inadvertently deleted by the respondent, phone contacts were made, or letters sent. Because of the possibility of human error in the editing process, final edits were made by computer at L.B.L. (described in a succeeding section).

1/ See Appendix B

After the initial edit, the forms were sent to San Francisco Optimation Center for recording. Here the data were keyed in by an operator using the ENTREX Key to Disk System; and with the use of a NOVA Mini Computer, the data were coded, packed, and transferred to magnetic tape according to a fixed format. The recording of this survey directly onto magnetic tape eliminated the costly, time consuming, and awkward handling of punched cards as were used on the previous survey.

The magnetic tapes were sent to U. C. Lawrence Berkeley Laboratory where programs were written in Fortran on a CDC-7600 computer to reformat, edit, analyze, sort, and summarize the information for producing the published tables at the end of Chapter 5.

Data from each form were reformatted for optimum compactness and ease of viewing. Each item in a form was checked to see if it had correct character type, was within reasonable limits, was logically consistent with itself, and was logically consistent with related items. Notations about probable errors were appended to each reformatted form and stored for future access or viewing on magnetic tape, chip store, and microfiche.

The reformatted, error-flagged forms were sorted with respect to the special assigned account number (HRD) for ease of comparing with the original form in cases where gross errors were noted. Obvious errors were corrected by editors, and when necessary, the manufacturer was contacted. Corrections were typed on cards, and the reformatted forms were changed, checked again, probable errors flagged again, and restored. This process was

repeated until a desired level of exactness was obtained. Then all probable duplicate forms were investigated and depleted where appropriate.

The final edit was then sorted in two ways: by SIC number, and by both county code and SIC number. These sorts were also stored on magnetic tape, chip store, and microfiche. Accumulations were made on each of the items from the reformatted forms in each of the sorts and stored for future access and manipulation. Detailed tables (4 digit SIC) were generated from the previous accumulations. They were checked for reasonableness, and with enough information being provided that questionable accumulations could be examined by going back to individual reformatted forms on microfiche, thus requiring more of the aforementioned editing. With the acceptance of the detailed tables, the water use values were expanded by use of employment data from the Employment Development Department in order to account for the unreported plants. Survey data from respondents reported in Tables 1 through 5 provide the sample used to estimate total water use shown in Tables 6, 7, and 8.

From the reported data, a unit water use, per employee, was calculated for each industrial group, in each county. In expanding the employee unit use, the value so developed was multiplied by the total number of employees known to be engaged in each industrial group, for each county.

Where responses were lacking for certain industries, the statewide average unit use value for that industry was

substituted in order to expand the data for that county.

Some problems were experienced where the employee location list included large numbers of office workers associated with certain industries, but actually located in other counties. To correct these situations, the water use associated with these office workers was redistributed to the counties where the manufacturing was known to occur. A case in point was the distribution of water associated with petroleum refining office workers in San Francisco County, to Contra Costa and Los Angeles Counties, where the processing plants are sited.

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